

July
1931

AMERICAN GAS ASSOCIATION MONTHLY

Nominating Committee Reports for 1931-32

The Gas Industry
in America

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of A. G. A. Coatings

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Fuel to Industry

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Sales Department as
Factor in Good
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ERNEST R. ACKER

List of Exhibitors at next A. G. A. Convention
Grows



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420 Lexington Avenue

New York, N. Y.

AMERICAN GAS ASSOCIATION MONTHLY

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VOLUME XIII

JULY, 1931

NUMBER 7

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The Association does not hold itself responsible for statements and opinions contained in papers and discussions appearing herein.

Published Monthly by the
AMERICAN GAS ASSOCIATION

Publication Office, American Building, Brattleboro, Vt.
Editorial Offices, 420 Lexington Ave., New York, N. Y.

Entered as Second Class Matter at the Post Office at Brattleboro, Vermont, February 10th, 1922, under the Act of March 3, 1879.

Subscription Rate

\$3.00 a Year



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F. A. Lemke
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LXXIV
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OUR OWN WHO'S WHO

◆ F. A. LEMKE, general manager of the Humphrey Company Division of the Ruud Manufacturing Company, Kalamazoo, Michigan, has been a prominent figure in the gas industry for many years. He was born in Mendon, Michigan, and attended public schools in Kalamazoo, after which he spent one year in the wholesale grain business. In October, 1898, he became associated with H. S. Humphrey, head of what then was known as the Humphrey Manufacturing and Plating Company, the corporate name later being changed to Humphrey Company. In 1913, the Humphrey Company and the Ruud Manufacturing Company, Pittsburgh, Penna., consolidated, but, until recently, both organizations continued as separate manufacturing and distributing units. Having devoted practically his entire business life to the Humphrey Company, Mr. Lemke advanced steadily until he became general manager of that concern. He is a director and member of the managing committee of the Ruud Company and president of the Ruud-Humphrey Water Heater Company of Texas. For a long while, Mr. Lemke has been active in work of the American Gas Association, being a former chairman of the Managing Committee, Manufacturers Section, and now is serving as a member of the Board of Directors.

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Mr. Paige Pays Tribute To British Technicians

TRIBUTE to the work of British technicians was paid by Clifford E. Paige, president of the American Gas Association and vice-president of The Brooklyn Union Gas Company, in an address delivered before the first International Gas Conference, held at London, England, June 3. The sessions were attended by delegates from all parts of Great Britain and from about ten other countries. Alexander Forward, managing director of the American Gas Association, also was among the American representatives.

"Your technicians," Mr. Paige told his audience, "have contributed much to the progress the industry has made in production methods, particularly with regard to the highly successful research work in the fundamentals of production at both high and low temperature, also in connection with the application of mechanical equipment to the operation of carburetted water gas units, and the dehydration of gas for distribution, to say nothing of the splendid utilization research work which you have accomplished."

Another outstanding and continuing achievement, continued Mr. Paige, was the progress made in combating

A. G. A. President Presented to Royalty



C. E. Paige

WHILE in London, last month, to attend the first International Gas Conference, Clifford E. Paige, president of the American Gas Association, was presented to the Prince of Wales at a luncheon, and later was invited to Buckingham Palace, where he also was presented to King George.

the ever-present problem of smoke abatement, as a result of the devoted attention given to this subject by the gas industry in Great Britain, in the interests of public health and happiness. It is a problem that Americans are facing in many of our larger cities, and the results of British research and the literature that has been prepared, are proving of great help in the United States.

Mr. Paige's address, in full, is printed elsewhere in this issue of the AMERICAN GAS ASSOCIATION MONTHLY

A dinner to the representatives from overseas who attended the International Gas Conference and the sixty-eighth annual general meeting of the Institution of Gas Engineers was given by the president of the institution at Grosvenor House on the evening of June 3. HAROLD E. COPP, president, was in the chair.

The following reply to a loyal message was received, signed by the private secretary to the King:—

"The King sincerely thanks the members of the Institution of Gas Engineers and the representatives from overseas assembled at the first International Gas Conference for their kind and loyal congratulations on his Majesty's birthday."



Acme—P. & A.
Prince of Wales

The toast of "Our Guests," submitted by the chairman, was acknowledged by Mr. FRITZ ESCHER (Switzerland), president of the International Gas Union; Mr. PAIGE, DR. H. SCHUTTE, German Association of Gas and Water Engineers, A. BARIL, Technical Gas Association of France; and G. H. HULTMAN, president, Swedish Gas Association.

Mr. Paige was among the company present at a dinner at the Dorchester Hotel, given by the London Committee of the British Trade Exhibition at Buenos Aires to His Royal Highness the Prince of Wales. He was the guest of Sir Francis Goodenough, and had the honor of being presented to the Prince, and the gratification of being engaged in conversation for

(Continued on page 288)

Major Forward's Address

ADDRESSING the First International Gas Conference, at London, England, June 3, Alexander Forward, managing director of the American Gas Association, was quoted by the London "Gas Journal" as follows:

"The American Gas Association can be more ably and technically represented by our President, Mr. Paige, and will be so represented on your programme later, but it remains for me to express our appreciation of the opportunity of attending your meeting and partaking of your hospitality. Over here we can see many things and hear many things that are new to us, and we can perhaps enjoy some things that we cannot enjoy in our own country. (Laughter.) It is a very great pleasure to us to receive visits from time to time from members of your organization and of others abroad, and we are always glad to see them at the American Gas Association offices and to do anything in our power to help them in presenting such information and contacts as they may desire. We learn a great deal from them, and we are happy to have them come and see us. Therefore, in a sense we are now returning a party call in being over here at this time. Moreover, the members of our organization and those who are active in the Gas Industry in the United States and in the Dominion of Canada are always so thoroughly well taken care of when they come to this side, that it is a pleasure indeed to make this public acknowledg-



Alex. Forward

ment of the fact. Several of your members who are residents on our side have particularly desired me to give you their regards, and best wishes. One of those men is J. B. Klumpp, a former President of the American Gas Association. He lives in Philadelphia and has been a member of your institution since 1907. Another is Mr. Gordon King, a member of my staff, as Service Engineer at the American Gas Association

headquarters. He joined the Institution as soon as he was eligible as a student member in 1905. Another is my friend Mr. Egner. Mr. Egner wrote to me on May 20, from his home in our capital city, Washington, where he is in retirement at the age, I believe, of 85. Mr. Egner sends me a printed programme of a meeting of the Evening Star Lodge of Freemasons on May 1, 1902, in connection with the annual meeting of the Institution of Gas Engineers. He was introduced, he says, by the late Walter King, Publisher and Editor of the 'Journal of Gas Lighting' of Bolt Court, Fleet Street. Sir George Livesey was one of the leaders of the Gas Institution then. Some of those, says Mr. Egner, whom he knew over here are now with the great majority.

"I thank you again for the opportunity to give you this brief message from America, to express our pleasure at being here, and to say that we shall be delighted to see any of you at any time at our headquarters on Lexington Avenue, New York."

Mr. Paige Pays Tribute to British Technicians

(Continued from page 287)

some considerable time by His Royal Highness, who subsequently asked Sir Francis to bring Mr. Paige to St. James for a further talk.

In opening the London meeting, Mr. Copp characterized the gathering as an event of unusual and historical importance by reason of its being the first International Gas Conference convened as such, with the assent and cooperation of the national gas associations throughout the world. He pointed out that the conference was the first to be held under the statutes of the International Gas Union (*Union Internationale de l'Industrie du Gaz*).

After extending a welcome to the

representatives from America, Australia, Belgium, Czechoslovakia, France, Germany, Holland, Hungary, Japan, Norway, Sweden, Switzerland, Yugoslavia, Brazil, British West Indies, Ceylon, Malta and South Africa, Mr. Copp said:

"Two of our colleagues from overseas are contributing papers to our proceedings; Mr. Clifford E. Paige, the president of the American Gas Association (who has journeyed from America with Major Alexander Forward, the managing director), and Dr. H. Schütte, the immediate past-president of the German Association of Gas and Water Engineers. On your behalf, I tender our sincere thanks to these gentlemen for their courtesy and their valued contributions."

Geo. B. Cortelyou Addresses Utility Advertisers

GEORGE B. CORTELYOU, president of the Consolidated Gas Company of New York, made an address of welcome June 16 to 200 delegates attending the annual convention of the Public Utilities Advertising Association at the Pennsylvania Hotel in New York. Mr. Cortelyou said that advertising must play a leading part in the future development of the nation's public utility companies. He further said:

"Within recent years the need for public understanding of the utility business has grown to a point where it is at least equal in importance to the technical and economic problems which continue to confront us. Cooperation on the part of the public is as necessary as within our own ranks in order to achieve and maintain the highest standards of efficiency and usefulness we can render. Advertising as the liaison officer of the utilities can do much to create an intelligent and enlightened public opinion, based on a sympathetic knowledge of our mutual requirements and aims. Public utility advertising thus has a real opportunity to demonstrate its value."

Mr. Cortelyou said it was conceivable, though not likely, that advertising as now known might in time be supplemented by some other means of public education, but the present trend, he said, is toward an increased use of advertising. Mr. Cortelyou outlined plans of the public utility companies to inform the public of the problems and conditions of that business immediately through the largest advertising program they have ever undertaken. He said that the executives of most utility organizations were agreed more than ever before in the belief that the progress of their companies would depend to a large extent on adherence to sound principles of education and promotion in the application of which advertising would play a leading and perhaps vital part.

William H. Hodge, of Chicago, vice-president of the Byllesby Engineering and Management Corporation, and vice-chairman of the Publicity and Advertising Section, American Gas Association, after asserting that the term "power trust" was the publicity slogan of politicians, said that there would be no advertising if the political ideas advanced by that group were to become dominant. He told the members of the utility group that "yardsticks" was the favorite term of the political "combination trying to hamstring the electric light and power companies of the United States." Answering the charge that the power companies enjoyed gross earnings showing an increase of \$44,000,000 over 1930 and 1929, he argued the companies had raised and invested in new plants \$800,000,000 to obtain that increase. In the past year the same companies extended their services to 550,000 new customers.

The Gas Industry in America *

By Clifford E. Paige, President

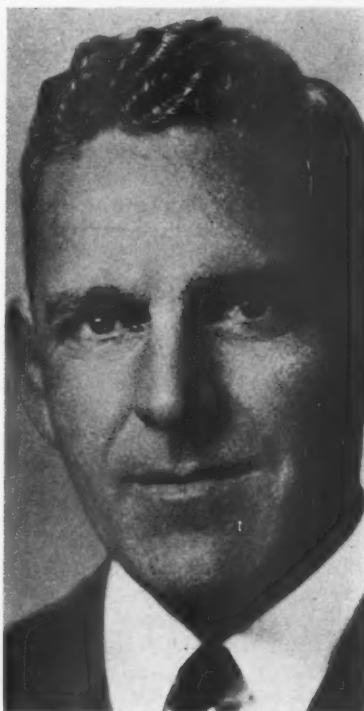
American Gas Association

It is a pleasure and a very great honor to come before this meeting as a representative of the American gas industry. We feel that this is an historic occasion in that it is the first time the President of the American Gas Association has been privileged to address you.

In addition to the visits, to and fro between the countries, of the personnel engaged in the service of numerous companies, there has been, we are glad to note, a constant and continuing interchange of information. It is therefore peculiarly gratifying to have this opportunity to meet and address so many of you personally and to extend to you the greetings of the gas industry of America as well as its very best wishes for a successful meeting.

Early Gas Associations

In speaking before such a group as this, the members of which come from older countries, I am impressed with the thought that history and long established custom are properly valued and appreciated, and we have noted with considerable interest that the sister organizations serving an industry organized nearly a century and a quarter ago have an ancient and honorable record. For example, while it is doubtless common knowledge over here, we find it interesting that the present German Association of Gas and Water Engineers was organized as the Society of German Gas Men in May, 1859; that the preliminary meeting of gas managers, known as the British Association of Gas Managers, was held in Manchester, December 15, 1863; that in 1873 both the Swiss Society of Gas and Water-works Men, and the Institution of Gas Engineers in the Netherlands, organized their respective national organizations. In 1874 not only was the first Congress of the



C. E. Paige

Societe de Technique de l'Industrie du Gaz en France held in Paris, but the Association of Gas and Water Industries in Italy was organized. Some of our predecessor organizations came into existence about the same time, the first meeting of the American Gas Light Association being held in Cleveland, Ohio, in September, 1872.

That the minds of the gas men of Great Britain and the United States must have been thinking along the same general lines, is indicated because in 1904 (November 19 to December 17) an International Gas Exhibition was held at Earl's Court under the auspices of an advisory committee of this Institution. The appropriate Gas Associations of France, Germany, Holland, Belgium,

and Italy had several representatives and in the reception tendered them were included several American visitors. In the same year (June, 1904), a Congress of gas associations of America in which ten associations, guilds and societies participated, was held at the Louisiana Purchase Exposition at St. Louis, Missouri. There, that distinguished leader and great prophet of our industry whom we still delight to honor, Henry L. Doherty, discussed gas association work and advocated the formation of a national gas association for which at that time the name American Gas Association was suggested.

Later the American Gas Institute was formed from the combined membership of the Ohio Gas Association, the Western Gas Association and the American Gas Light Association. The Institute was devoted to, and composed of, what might be called the technicians of the industry so that as a result there later came into being, in May, 1905, the National Commercial Gas Association. The Institute and the National Commercial Gas Association continued serving their respective fields until in 1918 appropriate committees of each organization agreed to the formation of a new association to be known as the American Gas Association.

American Gas Association

As is generally known the Association comprises the gas companies, the manufacturers of equipment and appliances, and individual members; its affairs are administered by an Executive Board which, when the Annual Convention is not in session, exercises exclusive jurisdiction over all affairs pertaining to its management, together with a permanent staff. The latter, specialists in every phase of the industry, are under the immediate direction of a Managing

* Address delivered before the First International Gas Conference and Sixty-Eighth Annual General Meeting, Institution of Gas Engineers, London, England, June 3, 1931.

Director and are located in New York City; Cleveland, Ohio; Dallas, Texas; and Los Angeles, Calif. The work of the Association is carried on by means of committees (assisted by the permanent staff), which may be "Sectional" or "General," because under the Constitution of the American Gas Association, as at present amended, we have a Natural Gas Department and six Sections, each of which has appropriate jurisdiction over all the matters relating to its respective functions; these are Accounting, Commercial, Technical, Manufacturers, Publicity and Advertising, and Industrial Gas. Each Department or Section is headed by its own Chairman and Vice-Chairman. It will readily be apparent, therefore, that there must of necessity be certain interests and activities of a more general nature than the classifications above listed and the Association has found it expedient and necessary to organize what we know as General Committees.

We believe that the cumulative effects of the coordinated and cooperative efforts put forth by the numerous component parts of our highly ramified industry have more than justified the creation of the Association. The representatives of all phases of the industry's activities serve together on the appropriate committees and as a result this devoted interest to a common cause cannot fail to present a unified front. Such a consummation is particularly valuable in our country where, as you doubtless all know, we have carried specialization very far.

Such cooperation as here indicated, however, is not confined to the industry, for we have endeavored, and we think with quite some success, to prosecute this study in fields which at first thought might appear to be not very closely related to ours. Examples of this are our activities in connection with dealers and plumbers, who frequently sell and install gas-burning equipment, particularly water heaters and ranges; the federal government groups, such as the Bureau of Mines, Bureau of Standards, Public Health Service and the like; manufacturers' representatives and other interested bodies which cooperate with the industry in prepara-

tion of the numerous specifications with which all appliances submitted to our Laboratory for test must comply.

Five-Year Program

There is nothing haphazard about the Association's activities. In general, the Association has followed a Five-Year Program, set up in 1926, by a committee of the industry's foremost men, headed by Hon. George B. Cortelyou, approved by the Executive Board and accepted unreservedly by the industry.

This Five-Year Program, just closing by expiration will, because of its success, be supplemented by another schedule of organized activities of similar purpose and scope. Briefly, it provides for cooperation within and without the industry, for improved selling methods, stimulation of selling efforts, a greater understanding and appreciation of gas service; it provides for educational campaigns, proper rate structures and their application, and for technical research; it invites attention to the subjects of asphyxiation and resuscitation; it enlists support of the Testing Laboratory; it advocates campaigns of advertising in trade journals; it solicits attention to national advertising; it supports courses in gas engineering, fellowships in educational institutions, and recommends that statistical work be kept responsive to the needs of the industry.

Its credo is:

"That there be continued adherence to the policy that the Association shall not extend its work beyond those objects which are of first importance and greatest practical value to the industry, it being obvious that if its activities become broadened beyond the scope of practical accomplishment, its influence will inevitably be weakened."

The success of this method of planning and charting a course, endorsed by the leaders of the gas industry in America, is evidenced by the fact that we are now about to enter the second of these "term-plan" programs following in general aspect the plan adopted in 1926.

Your technicians have contributed much to the progress the industry has made in production methods,

particularly with regard to the highly successful research work in the fundamentals of production at both high and low temperatures; also in connection with the application of mechanical equipment to the operation of carburetted water gas units and the dehydration of gas for distribution, to say nothing of the splendid utilization research work which you have accomplished.

Another outstanding and continuing achievement is the progress made in combatting the ever-present problem of smoke abatement as a result of the devoted attention given to this subject by the gas industry over here, in the interests of the health and happiness of your nations. It is a problem that we, too, are facing in the United States in many of our larger cities and the results of your research, and the literature you have prepared, are of great help to us. The mere listing of the foregoing, which automatically conjures up a long and imposing list, is sufficient; it, therefore, ill behooves me to deal with these things with which you are so thoroughly familiar. Rather shall I endeavor to touch upon some of those features of the gas industry in America which may, for geographical and economic reasons, be of interest to you in that they differ somewhat from the old established order of things.

In the United States the gas industry has shown a consistent and steady growth and at the present time serves 16,000,000 customers, 10,700,000 with manufactured gas and 5,300,000 with natural gas. During the year 1930 the industry sold 408,000,000,000 cu.ft. of manufactured gas with heating value approximately 540 B.t.u. per cu.ft. and over 1,940,000,000,000 cu.ft. of natural gas with heating value of over 1000 B.t.u. per cu.ft. The total volume of gas sold was 2,348,000,000,000 cu.ft., equivalent to 22,000,000,000 therms; for this the industry received \$873,000,000 (£180,000,000). At the present time the total amount of money invested in the gas industry in the United States is slightly over \$5,000,000,000 (£1,000,000,000).

A comparison of the industry in 1920 and 1930 shows the remarkable progress made in the last decade.

During this period the industry added over 4,600,000 customers, an increase of 40 per cent. Sales of gas increased 110 per cent and the revenues of the industry increased 61 per cent. Part of this growth is due to additional customers, but a large portion of the increase is due to the intensive development of existing markets. This is indicated by the fact that during the decade the sale of manufactured gas to industries has increased from 69,000,000,000 cu.ft. to 163,000,000,000 cu.ft., a gain of 135 per cent. In the year 1930, the manufactured gas industry sold over 25,000,000,000 cu.ft. of gas for house heating purposes; in 1920 sale of gas for this purpose was negligible.

The manufactured gas industry in the Dominion of Canada, is as much a part of the American Gas Association as is the gas industry in the United States. According to the latest available figures, those for 1929, the manufactured gas companies of Canada at the end of that year served 530,000 customers, an increase of 6 per cent during the year. The investment dedicated to these patrons aggregated more than \$65,000,000 and more than 18,000,000 cu.ft. of gas were manufactured during 1929, representing an increase of nearly 15 per cent over the preceding year. Mr. Arthur Hewitt, Vice-President and General Manager of the Consumers Gas Company of Toronto, Canada, who is well-known to most, if not all, of you, is a Vice-President of the American Gas Association.

During the last ten years, some interesting developments have occurred in the methods by which the manufactured gas industry produces its gas supply. For many years, carburetted water gas has been the foundation of the industry and in 1920 water gas comprised 60 per cent of all the gas distributed by manufactured gas companies. Although the production of water gas continued to increase each year, its relative importance declined so that in 1926 it represented only 51 per cent of the total gas distributed by manufactured gas companies.

Since 1926 the actual volume of water gas has shown a consistent de-

cline each year until in 1930 this kind of gas represented only 37 per cent of the total manufactured gas supply. This decline in water gas production has been due to the rapid increase in the use of coke oven gas, either produced in plants owned by gas companies or purchased from steel, chemical or coke companies. In 1920, coke oven gas represented only 10 per cent of the total manufactured gas supply while in 1930, it comprised 30 per cent. During the ten-year period the total volume of coke oven gas distributed increased 382 per cent.

During the last decade the developments in the field of gas production have changed the fundamental character of the industry. In 1920, 86 per cent of the total gas distributed by manufactured gas companies was produced in their own plants. In 1930, only 57 per cent of the gas distributed by these companies was produced in their own plants and 43 per cent was purchased from sources outside the gas industry, such as steel, coke, chemical and oil companies. In the past two years the amount of gas produced in gas company plants has decreased more than 9 per cent while the amount of gas purchased by gas companies from outside sources has increased 43 per cent.

During the period from 1920 to 1930 there has developed a rapid trend toward the interconnection of the mains of various companies and concentration of gas production in large efficient plants equipped with modern machinery. This development has resulted in the scrapping of many gas plants in small communities which are now supplied with gas through high-pressure gas lines from plants in large cities. This trend toward centralization is indicated by the fact that in 1919 there were 1,300 gas plants in operation in the United States while ten years later there were only 715, a decrease of 585 plants or 45 per cent.

Natural Gas

What is undoubtedly the outstanding feature which has affected the manufactured gas industry in the United States more recently has been development of the newly discovered natural gas reserves, and to a very

large degree, the vision and financial backing which made possible long-distance transportation.

Less than a decade ago eminent geologists predicted that the oil and gas supply of the United States would soon be exhausted. These predictions have led to greatly increased activities in search for oil which in turn have resulted in the discoveries of many new fields containing enormous quantities of oil and gas.

A few years ago natural gas main lines seldom exceeded one hundred miles in length and fourteen inches in diameter, but the distance of transmission and the size of pipe lines has progressively increased until now the largest lines are one thousand miles in length and twenty-six inches in diameter. The pressure under which the gas is transmitted in these pipe lines has also increased; up until 1926, three hundred and fifty pounds was considered a very high pressure on natural gas pipe lines; now there are lines operated at five hundred pounds and some under contemplation which will operate at seven hundred pounds pressure.

At the present time, natural gas is the only kind of gas used in six states and it constitutes over 90 per cent of the total gas consumed in ten additional states; it is marketed in thirty-six of the forty-eight states.

The largest new market for natural gas has been in the cities formerly served with manufactured gas. In some of these communities natural gas has completely replaced manufactured gas while in other places it has been mixed with water or coal gas to produce a mixture the thermal content of which lies between six hundred and one thousand B.t.u. per cubic foot. There have also been the communities immediately along, or adjacent to, the new natural gas lines en route to the larger centers of habitation. By means of these extensions, this fuel has been made available in localities which probably might never otherwise have been served.

In the past five years natural gas has replaced manufactured gas in nearly one hundred cities and towns ranging in population from 5,000 to

640,000 and over 1,400,000 gas customers have been affected. Such changes create important economic problems.

At the end of the year 1930 the natural gas industry was serving 5,300,000 customers, indicating that natural gas is used in the homes of 23,000,000 people. In the year 1930 the amount of natural gas consumed in the United States reached the record figure of 1,940,000,000,000 cu.ft. for which consumers paid \$415,000,000. Of the total natural gas consumed in the United States domestic or residential consumers use only 19 per cent; 37 per cent is used in drilling oil and gas wells and in other oil field operations, 5 per cent as fuel in petroleum refineries, 14 per cent in the production of carbon black which is so essential to the rubber tire and printing ink industries, 6 per cent in the production of electric power in central station public utility plants and 19 per cent by other classes of industrial customers.

There is no complete data available on the gas resources of the country, but in past years estimates of gas reserves have been made in several gas producing areas and in practically all cases these estimates have been revised upward as time went on because additional drilling of wells, especially those carried to depths of 5,000 to 7,000 feet, have produced gas which was previously undiscovered. In addition, there are potential gas fields in many states where little or no drilling has been attempted. New oil and gas resources are constantly being discovered which assure the natural gas industry of sufficient supply to meet the demands of the potential market.

In the light of this necessarily brief description of the natural gas side of our industry it will be readily perceived that the effects of the introduction of this potentially enormous volume of thousand B.t.u. gas must have been far reaching. So it has proved; and today there is probably no part of the gas industry which is not affected directly or indirectly by its advent. For example, the change-over from previously distributed manufactured gas to natural gas, as a substitute, or as an auxiliary supply for mixing with a

manufactured gas, has presented innumerable problems to our Technical Section. An example of this is seen in the study of all joints, and particularly the older types, with a view to repairing them for modern conditions of higher pressure as well as the introduction of a drier gas.

The physical characteristics of natural gas have increased the work and the scope of the Pipe Joints Committee so that it now is expending considerable effort on the testing of mechanical joints, leak clamps and various types of couplings, and all types of welded joints to determine their strength and shock qualities. The use of steel pipe has also made it necessary to determine the corrosive characteristics of various soils throughout the country with the thought that suitable pipe coverings can be specified for their protection. This work is being carried on in conjunction with the U. S. Bureau of Standards from the standpoint of determining the type and quality of protection required for any given soil in the United States. Some thought has also been given to main vibration, particularly with reference to mains in metropolitan districts.

The Mixed Gas Research Committee has been concerned with mixtures of various gases available primarily to determine what mixtures are advisable to use under certain conditions, particularly relating to utilization. This work is carried on entirely through American Gas Association laboratory research and covers a very wide range of gases, including the more common hydrocarbon gases which are available in the United States.

The Water Gas Committee is studying the modification of plant operations to accommodate various gas mixtures, from the standpoint of utilizing present plant equipment to accommodate mixtures of natural gas and still gases which are available in many sections of the country.

The Distribution and Chemical Committee are endeavoring to determine the effect of increased quantities of natural gas on distribution systems from the standpoint of leak detection and odorization together with all data that can be compiled on oil fogging, rehydration and the ef-

fect of a drier gas on meters and meter diaphragms.

Butane and Propane

There has been another very interesting development in the United States which we have watched grow, almost overnight, from a business supplying a relatively small and rather circumscribed demand to one of potentially large magnitude. Its applications are manifold and in many instances only restricted by transportation costs. I refer to higher members of the series of organic chemical compounds known as saturated hydrocarbons such as propane and butane, which are easily liquefied and just as easily gasified. By separating them from the natural gasoline extracted from natural gas, new fuels have become available.

Propane, which boils at the lower temperature, is so readily gasified, and requires so little heat for vaporizing it, that it is an ideal fuel for domestic gas installations beyond the reach of gas mains; it is distributed in steel bottles containing from 60 pounds to 100 pounds of liquid (21,600 B.t.u. per pound). By the use of a suitable pressure regulating valve, it can be burned in ordinary gas burners, bringing gas service to thousands of homes where otherwise gas would be out of the question.

Butane boils at a somewhat higher temperature than propane, and is similar to it, but is not so well suited for domestic installations; it has brought gas to small communities ranging from a few hundred to 5,000 population by means of butane-air-dilution plants. Seventeen per cent of butane vapor is mixed with eighty-three per cent of air and this mixture, because of the low partial pressure of the butane in it, will behave as a permanent gas.

The development of the liquefied petroleum gases is so new that no predictions can be made now as to the position they may eventually occupy in the gas industry.

Research

Closely allied to the ever-recurring problems of production and distribution of both manufactured and natural gas are the essential bases, in

fact the very fundamentals, which can be developed only by research, and so the American Gas Association created a research organization to study the technical problems of the industry and to investigate and pursue research in those subjects that need investigation and development. The field covered includes production of both natural and manufactured gas, transmission and distribution, and the various technical and competitive phases of utilization.

The research activities are under the general supervision and direction of competent committees headed by the Committee on Coordination of Scientific and Marketing Research. Certain research work is also carried on directly by the Testing Laboratory in connection with the preparation of Approval Requirements for various classes of domestic gas appliances.

There are many problems that confront the engineers and salesmen of the industry which, because of their nature or magnitude, would not otherwise be attempted for many years to come, unless some organized body with a national outlook vigorously attacked them.

The work is not all carried on in any one place nor is it confined to any one agency or class of agencies. Fourteen (14) institutions are now prosecuting research under A. G. A. direction; six (6) universities, two (2) United States Government Bureaus, and the private laboratories of six (6) industrial concerns, all financed from the general funds of the Association except the projects in industrial gas utilization. These projects are supported from a special fund underwritten for a five (5) year period by a group of about seventy-five (75) of the larger gas companies. Some typical projects are studies of pipe coating and corrosion, pipe joints, pipe capacities, mixed gases, and the open flow capacity of natural gas wells.

Probably the most important group of research projects yet undertaken by the Association has been the research in industrial gas utilization. There are twenty-two (22) of these projects seven (7) having been completed. They cover fundamental research in the application of heat

to core baking, bread baking, ceramics, forging, annealing, brass melting, enameling, galvanizing, house cooling, etc. In addition original work has been done in decarburization of steel, burning gas with preheated air, reducing burner noises, determining combustion space sizes, etc.

Testing Laboratory

Domestic utilization is still the backbone of the industry and an important factor in the improvement of utilization processes during recent years has been the appliance testing and research Laboratory operated by the Association. This institution was established and began operations in 1925 and since that time, marked improvement in the performance of domestic gas burning appliances has been accomplished.

The Laboratory tests domestic gas appliances for their ability to meet certain basic requirements for safety in performance and such constructional details as are essential to safe and satisfactory performance. The test standards employed are national in their scope and are prepared with the assistance of interested governmental and trade association agencies. To date some 16,500 different models have met these requirements. Such types are identified by the Laboratory's Seal of Approval. It is estimated that more than 75 per cent of all the domestic gas appliances sold or offered for sale in the United States during 1930 bore this seal of approval.

Aside from a growing acceptance on the part of the public of the use of certified types of equipment, quite a number of municipalities have adopted ordinances requiring in effect that all domestic gas appliances sold, installed or offered for sale within their limits must meet the requirements of the American Gas Association.

Maintenance of the quality of approved appliances is assured by a system of annual inspections and each year the Association's inspectors travel approximately 40,000 miles visiting some 250 manufacturing plants now producing approved appliances.

Quite recently the Laboratory ex-

tended its investigational activities into the industrial gas field. Complete studies of the process of recuperation, and of the possibilities of eliminating objectionable noises during industrial burner operation are now being made.

Utilization

In the domestic and commercial utilization of gas the important fields are water heating, refrigeration, central house and space heating.

In America the per capita consumption of water, particularly hot water, is very high; an estimate for hot water is about 50 gallons of hot water per day per family and nearly all homes are equipped with hot and cold water supply piping. An interesting type of appliance from the point of view of the small home is the continuous burning gas water heater, which burns from 3 to 5 cu.ft. of gas per hour—just about enough to offset the radiation loss from the storage tank, and at the same time build up about 35 to 50 gallons of hot water per day.

The gas refrigerator has seen very active development particularly for apartment house use, where it possesses important advantages in quietness of operation, freedom from interference with radio, and the promise of long, trouble-free life since it has no moving parts.

Our homes being generally equipped with central heating systems, house heating by gas has been remarkably rapid. We have a very considerable number of towns in which natural gas of 1,000 B.t.u. per cu.ft. is available at rates for the most part lower, on a cubic foot basis, than manufactured gas. With such advantages, gas becomes competitive with coal and oil as domestic house heating fuels even on a dollar and cents basis and disregarding the many advantages of comfort, cleanliness and convenience which gas possesses over other fuels. In the manufactured gas field central house heating has also shown increasing growth. Practically every gas company has special rates designed to secure the house heating business. Such rates are, in part, based on the competitive fuel situation, although they are not designed to bring manu-

factured gas and coal to a basis of dollar and cents equality.

In the commercial field, the American gas industry has borrowed an earlier development of the English gas industry, namely the diaphragm type of gas burner. For the hotel broiler, in which high speed, high grade results and low operating cost are the desired results, the diaphragm burner has proven its worth. This is a modification and improvement on the earliest form of surface combustion, developed by Professor W. A. Bone.

Another important commercial load being developed at present is the so-called large volume water heating business. Because of the fact that our apartment houses have a central hot water supply system, and for the purpose of filling in the summer valleys on the gas sales curves, it has become the policy of many companies to offer gas for large volume summer water heating at prices just a little over holder cost. As a result, we have added the business of apartment houses and hotels in which the daily hot water consumption runs well over 20,000 gallons.

Another appliance, new within the last year, and which has opened a field hitherto more or less closed to gas because of price comparison is the gas unit heater. This type of heater consists of a bank of tubes heated by gas, and over which a large volume of air is blown by an electric fan attached to the back of the unit. This heater, having an output capacity of 100,000 B.t.u. per hour in the smallest sizes, eliminates the need for boiler plant and for steam piping; it is only necessary to run a gas line, and supply the electric power from the nearest outlet.

Commercial

The commercial activities of our gas companies are tied in to close cooperation through the active participation of the responsible heads of various commercial departments in the program of the Association. Particularly in commercial fields have the many committee activities been found of greatest value, as they crystallize national opinion into more or less uniform modes of procedure.

To illustrate: House heating, for

example, in 1922 was an activity of only a very few gas companies and special rates for house heating were almost unknown. A national committee was formed, and its first efforts were to gather the technical data underlying house heating requirements. Following this, gas company interest grew rapidly, and the business began to expand until today there are literally hundreds of companies actively engaged in selling gas for house heating through the adoption of special house heating rates. Again in 1929, the need was felt for a more uniform policy in regard to sales and servicing of these appliances and a strong committee, comprising men right on the firing line in the house heating business, made it possible to carry through an ambitious project with great effectiveness.

Other committees exist for promoting the use of domestic ranges, water heating, incineration, laundry equipment, refrigeration, appliance servicing, trade and dealer cooperation, architects' and builders' service, window and store display. Because the high cost of appliances is a deterrent to the development of the business the Commercial Section has initiated an activity with the Manufacturers' Section looking to the simplification of gas range design and reduction in number of models manufactured, so that, first, the cost of manufacturing gas ranges may be reduced, and second, the number of models and parts required to be carried in stock by the gas companies may be reduced.

The statistics of gas consumption in the United States indicate that families using only a gas range burn about 2,000 cu.ft. of gas per month. Since such families do not enjoy to full advantage the services which the gas industry can render in water heating, incineration and refrigeration, the commercial departments have devoted considerable time to studies of how this load can be built up.

The public is getting away from poor appliances, and is realizing what the gas industry is offering through its plan of proving gas appliances to be modern merchandise. When gas appliances were of a bar-

gain counter nature and the merchant interested only in merchandising turnover and lost interest in the delivery of the appliance, complaints were frequent, and were usually based on poor gas or poor service. These things we have been trying to offset with our good will and public relations efforts.

In this particular phase of our commercial activities and its necessary publicity and advertising, I should like to take this opportunity to compliment the British gas industry upon the outstanding work undertaken by the British Commercial Gas Association. We are close students and ardent admirers of this work to say nothing of the respect and admiration we, in the United States, have for your distinguished leader Sir Francis Goodenough.

Publicity and Advertising

In the manner and method of sales of our product, particularly in publicity and advertising, our Publicity and Advertising Committee renders direct services to company members by supplying suggestive advertising material, which is published in local newspapers, sometimes as originally written and sometimes altered to meet local conditions.

Just now our Advertising Committees are deeply interested in working out a program looking toward the inauguration of a radio campaign. A quarter or half an hour on fifty or more broadcasting stations, about the minimum which could adequately reach people in the States, is an expensive gesture and before the Association enters upon this form of telling the world about gas in a national way, the matter will be submitted to our membership to see if the cost involved would be justified.

Generally speaking, our Publicity and Advertising Committees have charge of the preparation of all classes of publicity and advertising service issued for the industry and in addition have advisory duties in connection with the American Gas Association MONTHLY, which is our organization's official publication. The A. G. A. MONTHLY's principal object is to reflect Association activities. It has a circulation of 6,675 copies.

Industrial

With regard to utilization for other than domestic purposes, rather than manufacturers and sellers of gas we have now become merchandisers of heat service. Our markets are in every field where the application of heat is a requirement. Every modern industry is an actual or potential customer for our product. Also, they are potential customers for merchandisers of other forms of heat.

Our Industrial Gas Committees have planned their efforts along two distinct paths; first, the education of gas company personnel in the technical phases of the utilization of gas and in the higher development of sales ability; second, to create attention among our potential users for recognition of our fuel as the ideal.

To accomplish the first we have committees such as the Utilization Data Committee gathering and publishing data on all possible uses for gas, and specific committees gathering information and recommending policies on the use of gas in the hotel and restaurant field and in the large volume water heating field. Also, the Section publishes pamphlets and books for distribution and sale to our industrial men, known as the Industrial Gas Series, each volume of which is a complete treatise on a particular subject.

The second part of this program is accomplished through committees such as our Advertising Committee which advertises in a number of trade journals of specific industries, and our Publicity Committee which furnishes articles for publication in such trade journals.

Under the direction of the Industrial Gas Section a national campaign on industrial advertising was inaugurated some five years ago. This advertising program includes purchase of advertising space in trade journals and engineering college publications. The committee in charge makes every effort to induce the local gas companies to tie-in with the national campaign through suitable advertising in their local newspapers and other media.

National Exhibitions

Exhibitions of industrial gas-burning equipment in which our Indus-

trial Gas Section cooperates with the gas companies and manufacturers are held in connection with the annual meetings of the Steel Treathers Association; Ceramic Society; National Exposition of Power and Mechanical Engineering; International Bakery Equipment Exposition, and Heating and Ventilating, a policy we hope to expand.

Our Manufacturers' Section performs, in addition, a most useful and valuable function in that every year at our Annual Convention they "put on" an exhibit of all of the latest developments in production and utilization equipment, as well as all the necessary appurtenances to an industry with so many and varied angles. In 1919 some 9,000 sq.ft. of space were required by 100 exhibitors, whereas at our recent Convention (1930) 253 exhibitors required 75,000 sq.ft.

Rates

Now, the all-important question of rates and rate-making. From the ancient monthly charge applicable to gas lighting, now a matter of history, the development of gas cooking brought about a flat charge of so much per thousand cubic feet regardless of the amount used. As domestic uses grew in number, with varying demands, and when gas entered the industrial and house heating fields, it became necessary to make such rates as would command large volume business by suitable reductions of the consumption charge for large volumes. Out of this grew the service charge, the initial charge and the minimum monthly charge on domestic business, and the demand charge on industrial and house heating business, so favorable to the development of the industry, and so just to the consumer by charging against each customer relatively what it costs to serve him. This theory is now in general practice in the United States and has been recognized by innumerable commissions and court decisions. Efforts to bring this about have resulted numerically in a multitude of rate forms and some company schedules contain as high as ten different rates for different classes of service.

Last year witnessed the birth in

America of the thermal basis of billing customers. This was done in August, 1930, by the second largest gas company in America, The Peoples Gas Light and Coke Company of Chicago. At the present time 9 of the larger companies, serving 25 cities and towns in various sections of the country, have adopted this therm method of billing, and the future promises an even more widespread use of the method of billing with which you are all so familiar.

An important factor in the adoption of this method of billing is the expansion and development of the natural gas phase of our industry. In former years the average American gas company was a compact self-contained local affair, and the thermal content of its product was adjusted to suit local conditions, and remained relatively stable for years, but today in many sections of the country our companies are really a vast interconnected pool of gaseous energy. Some companies now serve gas consisting of a mixture of By-Product Coke Oven Gas, Water Gas, Oil Still or Refinery Gas, as well as Natural Gas, and the physical and economic modifications of all these factors present complicated problems which may necessitate variations in the thermal content of the gas marketed.

Statistical studies of all the rates in effect in the territories served by companies supplying gas in the United States are shown elsewhere (Tables 1 and 2) and the comparison for the five-year period, January 1, 1925, to January 1, 1930, indicates that there is a definite trend toward

1. The use of more rates, i.e., different rates for different classes of service.
2. The recognition of the service cost element in domestic rates, either through a service charge or a relatively high initial charge for the first few hundred cubic feet.
3. The establishment of the demand principle in industrial and house heating rates, through the use of demand charges or rates of the Wright Demand type.

1. The use of more rates. Between 1925 and 1930 the number of rates other than general rates increased sixfold (from 169 to 1038).

2. The recognition of the cost element in domestic or residence rates. When house heating is excluded we find that the cost of supplying other domestic service consists largely of customer cost which is alike or almost alike for all customers. The demand cost is not important until house heating is considered, and it is only natural that we find the general domestic rates changing gradually to rates which either have a direct service charge or which carry an element of service cost in the charge for the first few hundred cubic feet. There have been numerous pertinent decisions from the regulatory bodies (Public Service Commissions) and the courts which indicate a growing recognition of the fundamental requirements of the gas industry with reference to rates and rate-making. Such decisions have definitely approved, as being best for the customer, the service charge, the minimum bill or that form of rate in which is incorporated some of the elements of the cost of service in the charge for the first few hundred cubic feet.

It is necessary to keep in mind that if service cost element in the rate is too large, the commodity charge will be lowered to such an extent that considerable peak load space heating may result. If the service cost element is small, the resulting commodity charge may be so high that the company may not be able to obtain much additional load from water heaters and other smaller appliances.

3. The establishment of the demand principle in industrial and house heating rates. In supplying house heating service, the volume per customer is very large and the diversity factor practically disappears owing to everyone turning on his maximum requirements during extremely cold weather. Thus a demand charge becomes more important. Most of the house heating rates now in effect contain demand charges based on the square feet of radiation in the home. In industrial

service a demand charge which permits the customers with high load factors to earn a lower average price, enables the gas company to better meet competition.

In nearly, if not quite, every state of my country a public service commission or board has been created to administer the public service regulatory laws of the state. These commissions mostly have broad jurisdiction over rates, service, the issuance of securities, etc., and in many states no new utility may begin business without first securing the commission's approval. The orders and decisions of these commissions, however, are subject to review by the courts of the respective states, as well as by the federal courts of the United States up to and including the court of last resort, the Supreme Court of the United States.

The principal question which brings such matters into the United States courts is violation of that Section of the federal Constitution of the United States prohibiting confiscation of property. This section has been held to forbid the enforcement by regulatory bodies of rates which are not sufficient to enable a public utility company to realize a fair return upon the value of the property.

As a result of the work of our rate and similar committees in other branches of the public utility industry, there has developed a great sense of unity, common interest, and co-operation between the different groups of public service enterprises in the handling of valuation and other basic rate questions. Rules and principles of valuation judicially determined in railroad or telephone cases frequently become the controlling precedents in gas and electric cases, and vice versa.

Marked progress along these indicated lines has been made to such an extent that the fundamental principles which must control regulatory rate administration and service are gradually being placed outside the field of controversy by successive judicial decisions, which necessarily become the guide marks for administration by the state commissions. The subject of rates and rate-making is today being more thoroughly and courageously studied by company

executives, counsel and public officers; and phases that were long left obscured and neglected are far better understood than formerly, with the aid of continuous clarification from the courts and some of the commissions.

The subject of the legal basis of rates, though constantly receiving clarification, is a living and ever-developing one, and hence can never become completely stabilized. New problems, particularly those presented by the present rapid development of natural gas supply on an enormous scale, call for the enunciation of new legal principles for rate-making or new applications of old principles.

Further reference to the statistical tables previously mentioned also illustrates the growing use of promotional rate structures in the general service and domestic field.

Five years ago only 25 per cent of the domestic rates could be termed promotional or in any way based on sound theories of rate-making practice, but today nearly 50 per cent or one half of domestic rates embody some of the elements of fixed cost; this 50 per cent probably represents 80 per cent of the entire gas sold.

In addition to this marked increase in the number of domestic rates reflecting the element of fixed cost there have also been significant changes in the provisions regarding minimum bill. Five years ago nearly 10 per cent of the domestic rates had no minimum bill provision, that is, if the customer used no gas he received no charge from the company. However, today nearly 93 per cent of the domestic rates for gas service in America contain some sort of minimum bill provision.

While as yet there are relatively few of the three part demand rates applying to domestic service, the use of these demand rates reflecting the various elements of cost has shown a marked increase during this period. This is especially true of the rates for heating homes and dwellings with gas as the number of demand rates for this type of service increased from 7 at the beginning of the period to 164 at present.

The extent to which rates for special classes of service have increased

TABLE I
Comparison of Manufactured Gas Rates in Effect on January 1, 1925 and January 1, 1930
CLASSIFICATION OF RATES ACCORDING TO CLASS OF SERVICE AND TYPE OF RATE SCHEDULE
Manufactured Gas Industry in the United States

Rate Type No.	Type of Rate	Classes of Service											Total Number of Schedules for All Classes of Service								
		Class 1 General Service or Domestic Rates	Class 2 House Heating Rates	Class 3 Industrial Rates	Class 4 Commercial Rates	Class 5 Industrial and Commercial (Wholesale) Rates	Class 6 Water Heating Rates	Class 7 Commercial or Building Heating Rates	Class 8 House- Heating and Industrial Rates	Class 9 Off Peak Industrial and Commercial Rates	Class 10 Special Domestic Rates Only to Custom- ers Using Gas- Fired Water Heaters	Class 11 Miscel- laneous Rates									
1	Straight Line Rate	231	125	7	133	12	4	5	6	1	6	1	8	0	1	1	0	0	0	0	258
2	Step Rate	14	12	0	3	6	0	1	0	2	0	0	0	0	0	0	0	0	0	0	17
3	Block Rate	459	473	6	51	46	72	4	10	0	20	1	7	0	11	0	1	0	2	19	516
4	Block Rate with Small Initial Block Constituting Minimum Bill and Re- mainder of Schedule of Block Rates with Small Initial Block Constituting Minimum Bill and Re- mainder of Schedule of Block Rates	11	23	2	15	0	2	0	0	0	3	0	1	0	4	0	0	0	0	6	13
5	Straight Line Rate with Small Initial Block Con- stituting Minimum Bill and Remainder of Sched- ule of Block Rates	134	300	12	26	2	13	1	12	0	15	0	6	0	1	1	5	0	2	0	14
6	Service Charge plus Gas at Straight Line Rate	36	41	0	14	5	1	0	0	0	0	0	2	0	1	0	0	0	2	0	1
7	Service Charge plus Gas at Block Rate	61	74	1	20	8	14	0	1	0	5	0	9	0	1	0	1	0	0	0	12
8	Service Charge plus Gas at Demand Rate	3	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	Two Part Demand Rate	3	18	3	125	17	73	0	16	4	49	0	7	0	15	0	0	0	2	0	3
10	Three Part Demand Rate	1	14	4	39	10	23	0	3	5	17	0	0	0	0	1	4	0	0	0	27
11	Wright Demand Rate	0	3	5	17	0	21	0	2	1	0	0	13	0	1	0	0	0	0	22	311
	Flat Rate	0	0	0	0	0	0	0	0	0	0	0	2(a)	0	0	0	0	0	0	0	21
	Miscellaneous Rates	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	101
																					6
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(a) Flat Rates based on demand	(b) Garage heater rates	(c) Flat monthly charge for gas refrigerator
1.00	1.00	1.00
2.00	2.00	2.00
3.00	3.00	3.00
4.00	4.00	4.00
5.00	5.00	5.00
6.00	6.00	6.00
7.00	7.00	7.00
8.00	8.00	8.00
9.00	9.00	9.00
10.00	10.00	10.00
11.00	11.00	11.00
12.00	12.00	12.00
13.00	13.00	13.00
14.00	14.00	14.00
15.00	15.00	15.00
16.00	16.00	16.00
17.00	17.00	17.00
18.00	18.00	18.00
19.00	19.00	19.00
20.00	20.00	20.00
21.00	21.00	21.00
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26.00	26.00	26.00
27.00	27.00	27.00
28.00	28.00	28.00
29.00	29.00	29.00
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93.00	93.00	93.00
94.00	94.00	94.00
95.00	95.00	95.00
96.00	96.00	96.00
97.00	97.00	97.00
98.00	98.00	98.00
99.00	99.00	99.00
100.00	100.00	100.00

TABLE 2
Comparison of Manufactured Gas Rates in Effect on January 1, 1925 and January 1, 1930
PERCENTAGE DISTRIBUTION OF RATES FOR EACH CLASS OF SERVICE ACCORDING TO TYPE OF RATE SCHEDULE
(This Table is based on Data shown in Table 1)

[illegible]

during the period is also noteworthy. For example, five years ago the total number of house heating rates was only 40 whereas today there are more than 10 times that number.

The same general trends are apparent for rates applicable to other special classes of service such as industrial and commercial uses, water heating, and other rates designed to secure special classes of business.

Statistics

The information on which these tables are based and in fact, all the financial and operating data published by the American Gas Association are secured through its Statistical Department; its activities may be considered under two general phases. There is first the gathering and collection annually of the general statistics on the industry, such as plant capacity and data on production, sales, customers, and by-products, together with a detailed income statement and balance sheet. Most of the data outlined above are published in bulletins issued from time to time by the Association.

In addition to such annual data, there is also collected monthly data on production, sales and revenues from companies representing about 80 per cent of the manufactured and natural gas sold. The publication of these current monthly data on operating and financial trends within the industry in daily general and financial newspapers has been of great value, not alone to the industry itself, but to the financial and investment community.

The collection of statistics on the gas industry is somewhat complicated by the interrelations of this industry on the one hand with the coke and steel industries through the purchase from these industries of by-product coke oven gas, and on the other with the petroleum industry through the utilization of natural gas.

Accounting

Closely allied with the collection of statistical information, its interpretation and dissemination, is the work of the Accountant, which it will be noted from my earlier references is represented by a Section of our Association.

Perhaps the greatest contribution of the accountant, during the last decade, to the progress of the gas industry in America, is the adoption of mechanical aids to accounting work. It would be difficult today to find, even among the smallest of our utilities, one that has not employed, to some extent, the use of machines in accounting work. The customers' ledger of a few years back, a bound cumbersome book, is rapidly losing favor and in its place is found a card carrying all the information necessary to the keeping of the customers' accounts. In some instances even the card is displaced and a stub, which is part of the monthly bill, serves the purpose of the ledger account. In addition to their use in customers' accounting routines, machines are employed in accounting for stores, in the keeping of general ledgers, payrolls and property accounts, and are always employed where their use will economically produce speed and accuracy. Machines are also used by the accountant for such purposes as sales analysis, as an aid to the rate maker and as an aid to the salesman, in the tabulation of the results of the merchandising of appliances. Progress has been made in the development of mechanical accounting equipment through the cooperation of the utility accountants with the manufacturers of accounting machinery.

The Accounting Section Committee in conjunction with committees representing the other major Utilities and in cooperation with representatives of the several State Commissions secured the adoption, by the States, of a nation-wide uniform classification of accounts, thus enabling, without the loss of time, the preparation of consolidated statements and standards of comparison.

Education

Educational work is another vital activity and the Association has always cooperated with the educational institutions in their efforts to offer instruction of particular interest to the gas industry. Lecturers are provided to outline the practical application in the production, distribution and utilization of gas of the theory taught in the classroom. The

advice of the Association has been sought and supplied on the conduct of specialized courses intended to train for employment in the industry. There are now gas engineering courses offered under separate departments by two outstanding institutions in the United States—The Johns Hopkins University and Purdue University, both of which are making splendid progress. Other institutions offer courses especially designed to train engineers for the gas industry although they are not established as separate departments.

In order to stimulate the efforts of the various gas companies to render an outstanding degree of public service in their local communities a new award has recently been offered to gas company members of the Association; each award is limited to companies falling within a certain size so that their conditions of service may be reasonably similar. The nature of the award is significant in that it comprises three scholarships at one of the universities offering special courses for public utility executives, it being contemplated that these scholarships will be filled by the three executives in charge of finance, operating, and sales activities so as to bring about a higher degree of coordination between these departments.

In an effort to supply specialized instruction to employees of the gas industry, instruction which is generally not available elsewhere the Association offers courses in Domestic Gas Salesmanship, prepared for gas company employees engaged in the sale of gas appliances to domestic customers; Sales Administration and Management, intended to be used by department heads in perfecting better sales administration and management methods in the domestic, commercial and industrial gas fields; Industrial Gas Salesmanship, designed to give the salesman a detailed grasp of the uses of gas in industry. In addition, there are home study courses on Manufactured Gas requiring an elementary knowledge of physics and chemistry, and a home study course on the Manufacture, Distribution and Utilization of Gas written in non-technical language. A technical home study

course in natural gas is also in preparation. Scholarships in recognized institutions are also awarded.

Since the public is prone to receive its impression of the gas industry from meter readers, collectors, telephone operators and others whose positions bring them in daily contact with customers, these employees have vast power to create a friendly or hostile atmosphere. Of the various training programs designed to improve employee performance on the job, none has been so productive of results as the Association's Course in Employee-Customer Relations. The purpose of this program is to stimulate employees to analyze customer contacts and plan a future procedure so that correct methods of dealing with customers become habitual. There are more than five thousand contact employees enrolled in this Course and the executives of many gas companies tell us that the Course has crystallized employee thinking to an extent never before reached.

Asphyxiation and Resuscitation

Asphyxiation and Resuscitation are subjects of the continued attention of the Committee responsible for their study, in order to promote the use of safe methods of producing, distributing, and utilizing gas in the home and in industry. The work comprises collection and interpretation of employee accident statistics; preparation of pamphlets and posters designed for use by gas companies in promoting safe operating methods; award of medals for successful resuscitations accomplished in cases of asphyxiation such as the McCarter Medal Award made available through the generosity of Mr. Thomas N. McCarter, President of the Public Service Electric and Gas Corporation of New Jersey, to gas company employees for successful application of the Schaefer Prone Pressure method of resuscitation; examination, test and approval of first aid and safety devices and other related activities.

During the past three years a special commission of the Association, on Asphyxiation and Resuscitation, has sponsored research work by the United States Bureau of Mines de-

signed to ascertain substances suitable for addition to gases distributed by the manufactured and natural gas branches of the industry, which would act as warning agents either by virtue of odors or because of so-called irritant effects. The final report of this investigation will cover all aspects of the use of such agents from the Laboratory and limited field test angle and it is expected that gas companies generally will subject these substances to the prolonged field test necessary to prove their suitability and effectiveness.

The widespread extension of natural gas service in recent years has brought about a demand for the use of some odorizing agent to signify

the presence of this otherwise odorless gas. A number of natural gas companies are already using odorants continuously for this purpose and others for intermittent tests of distribution systems, house piping, and consumers' appliances to disclose leaks of all kinds.

In bringing these remarks to a close permit me to again remind you that the American Gas Association, through its President, is deeply conscious of the honor you have done it in asking us to participate in this international program. It has been with no small pleasure that I have attempted to tell you something about the problems of the industry in the United States.

Johns Hopkins Awards Degrees to Three

HAVING completed the undergraduate course in gas engineering, three young men were awarded the Bachelor's Degree at Johns Hopkins University, Baltimore, Md., June 9. They were:

Edward V. Fineran, of Washington, who has entered the employ of the Washington Gas Light Company, Washington, D. C.

Robert Kyle, of Baltimore, who has entered the employ of the American Gas Association Testing Laboratory, Cleveland, O.

Frank F. Merker, of Baltimore, who has entered the employ of the Consolidated Gas Electric Light and Power Company of Baltimore.

Since the Gas Engineering Department was established at Hopkins, in 1924, twenty-five students have graduated, three with the Doctor's Degree.

Technically trained men are urgently needed in the gas industry. To supply this need, more students should be enrolled. It is expected, of course, that new students will enroll in the Fall. Gas companies should not, however, depend upon this usual procedure alone to augment the student enrollment, but should immediately establish scholarships for promising young men in their territory who desire to prepare themselves for careers in the gas industry.

During the past year, the American

Gas Association renewed its scholarship to Hopkins for the year 1931-32. Gas companies now supporting scholarships in Gas Engineering at The Johns Hopkins University are as follows:

Atlantic City Gas Company.....	1
Central Public Service Corporation, Chicago, Ill.....	4
Consolidated Gas Company of New York, New York.....	2
Consolidated Gas Electric Light and Power Company of Baltimore, Baltimore, Md.....	2
Philadelphia Electric Co., Philadel- phia, Pa.....	1
The Columbia Gas and Electric Cor- poration, New York.....	1
The C. H. Geist Company, Philadel- phia, Pa.....	2
The Koppers Company, Pittsburgh, Pa.....	1
The Washington Gas Light Com- pany, Washington, D. C.....	4

Companies which have no scholarships now are invited to establish one or more. This will be a most effective means of cooperation and will insure a substantial number of graduates each year technically trained to serve the Industry.

For information as to details, address Dr. Wilbert J. Huff, Professor of Gas Engineering, The Johns Hopkins University, Baltimore, Maryland, or E. B. Luce, Educational Director of the Consolidated Gas Electric Light and Power Company of Baltimore.

Named for A. G. A. Directorate



F. S. Wade



B. J. Mullaney



H. C. Abell



P. S. Young



Herman Russell



C. N. Lauer



F. C. Freeman



F. A. Miller



J. S. DeHart

Charles H. Dickey Dies at California Home



C. H. Dickey
June 17 of a heart attack at his home in Del Monte, Cal.

Mr. Dickey, who was born in Baltimore seventy-two years ago, moved to New York twelve years ago and later to California.

He is survived by a widow and six children: Mrs. Carpenter of Hartford, Conn.; Mrs. Oscar Johnson and Mrs. Irving Randall of Chicago, Mrs. MacCondray of San Francisco, and Charles H. and William D. Dickey of San Francisco.

The other survivors are two sisters and three brothers living here: Mrs. Wright Nichols, Miss Henrietta Dickey, and Philip S., George S.

and Edmund S. Dickey. The latter now is serving as Chairman of Manufacturers' Section of the American Gas Association.

To Expedite Service to Boston Customers

CENTRALIZING its customers' service and engineering work to gain further efficiency and faster service, the Boston Consolidated Gas Company, Boston, Mass., will soon begin construction of a large service station and garage at McBride Street, Jamaica Plain.

With the completion of the new building next December virtually all of the company's service activities can be brought together at a more central location in the company's territory, accomplishing shorter trips and speedier service in answer to customers' calls for installation and service work.

Laying New Gas Main in Charlotte, N. C.

THE Charlotte (N. C.) branch of the Southern Public Utilities Company has underway the laying of a ten-inch gas main from the intersection of East Fourth and South McDowell streets to join the main at North Cecil and Armory Drive. This

new main will enable the company to render more efficient service to its customers throughout the northeastern section of Charlotte, and will take care of future demands for service brought by the development of that section.

A. C. Fieldner Wins Lamme Medal

A. C. FIELDNER, chief engineer, Experiment Stations Division, United States Bureau of Mines, Washington, D. C., was awarded the Lamme Meritorious Achievement Medal by the Ohio State University on June 8. This gold medal, awarded annually to a graduate of one of the departments of the university for meritorious achievement in engineering or the technical arts, was established by the will of the late Benjamin G. Lamme of the engineering department of the Westinghouse Electric and Manufacturing Company. Mr. Fieldner is a member of the first class in chemical engineering graduated from Ohio State University and is one of the first two recipients of the Lamme Medal.



A. C. Fieldner

Nominating Committee Reports for 1931-32



R. W. Gallagher

To Members of the American Gas Association:

IN compliance with Section 2 of Article II of the By-Laws of the American Gas Association, announcement is hereby made to the membership of the following report of the General Nominating Committee which will be presented to the annual convention in Atlantic City, N. J., in October, 1931:

For President—
R. W. Gallagher, President, The East Ohio Gas Company, Cleveland, Ohio.

For Vice-president—Arthur Hewitt, Vice-president, Consumers Gas Company, Toronto, Ont., Canada.

For Vice-president—N. C. McGowen, Vice-president, United Gas



Arthur Hewitt

Public Service Co., Houston, Texas.

For Vice-president—Howard Bruce, Chairman of Board, Bartlett-Hayward Co., Baltimore, Md.

For Treasurer—W. J. Welsh, President, New York and Richmond Gas Company, Staten Island, N. Y.

For Directors—Two-Year Terms:

F. S. Wade, President, Southern Counties Gas Company, Los Angeles, Calif.



Howard Bruce

Public Service Electric & Gas Co., Newark, N. J.

H. Russell, President, Rochester Gas & Electric Corp., Rochester, N. Y.

C. N. Lauer, President, Philadelphia Gas Works Co., Philadelphia, Pa.

F. C. Freeman, President, Providence Gas Co., Providence, R. I.

F. A. Miller, Chairman of Board, S. R. Dresser Mfg. Co., Bradford, Pa.

J. S. DeHart, Jr., President, Isbell-Porter Co., Newark, N. J.

Respectfully submitted,

H. C. Morris, *Chairman* A. H. Hall
F. H. Bivens John G. Learned
Howell Fisher H. R. Sterrett



N. C. McGowen

B. J. Mullaney, Vice-president, The Peoples Gas Light & Coke Company, Chicago, Ill.

H. C. Abell, Vice-president, Electric Bond & Share Co., New York, N. Y.

P. S. Young, Vice-president,



W. J. Welsh

The following members have been nominated by Section Nominating Committees to serve as section officers for the next Association year:

Accounting Section: Chairman—Wm. A. Doering, Boston Consolidated Gas Co., Boston, Mass.; Vice-chairman, J. M. Roberts, The Peoples Gas Light & Coke Company, Chicago, Ill.

Commercial Section: Chairman—Samuel Insull, Jr., Midland United Co., Chicago, Ill.; Vice-chairman, Walter C. Beckjord, Boston Consolidated Gas Co., Boston, Mass.

Industrial Gas Section: Chairman—A. J. Peters, Consolidated Gas Company of New York, New York, N. Y.; Vice-chairman, W. F. Miller, Public Service Co. of Northern Illinois, Chicago, Ill.

Manufacturers Section: Chairman—D. F. Kahn, Estate Stove Company, Hamilton, Ohio; Vice-chairman, D. B. Stokes, United States Pipe & Foundry Co., Burlington, N. J.; Vice-chairman, Robert M. Leach, Glenwood Range Company, Taunton, Mass.

Publicity & Advertising Section: Chairman—W. H. Hodge, Byllesby Engineering & Management Corp., Chicago, Ill.; Vice-chairman, H. Obermeyer, Consolidated Gas Co. of New York, New York, N. Y.

Technical Section: Chairman—I. K. Peck, Midland United Company, Chicago, Ill.; Vice-chairman, J. A. Perry, United Gas Improvement Co., Philadelphia, Pa.

Natural Gas Department: Chairman—T. J. Strickler, Kansas City Gas Company, Kansas City, Mo.; Vice-chairman, L. K. Langdon, Union Gas & Electric Company, Cincinnati, Ohio.

Components of Coal As Seen Through the Microscope

COALS are composed essentially of two visibly different major components which are present in different types of coal in greatly varying proportions, according to Dr. Reinhardt Thiessen, Research Chemist on the Constitution of Coal at the Pittsburgh Experiment Station, of the United States Bureau of Mines, Department of Commerce. These two components are designated as anthraxylon and attritus. Anthraxylon is a structurally simple component, while attritus is a complex component, composed of a large number of various plant entities. In addition to these two major components, there is a third, minor component, called fusain or "mineral charcoal," which is found in most coals in relatively small proportions, although occasionally layers are found containing considerable amounts. Its origin and formation is a much debated question upon which there is no agreement. Apparently fusain is derived from woody tissue of which the structure is often well preserved. It is higher in carbon content and lower in volatile matter than the other components, and has no coking properties.

Anthraxylon is the undisintegrated woody tissue of plants. It shows under the microscope a more or less visible homogeneous cell structure. Bright coal bands are essentially anthraxylon, being the stems, branches, twigs and roots of plants that were buried in the vegetable debris during the peat stage, coalified and subsequently flattened, but yet remaining as unit constituents in the final coal bed. The anthraxylon strips or lenses vary in thickness from a fraction of a millimeter to several centimeters. In general, they have a smooth, black to a highly lustrous appearance according to the rank of the coal—the higher the rank the higher the gloss. The coking properties of coal are due mainly to the anthraxylon components. However, all anthraxylon will not coke. It possesses this property only in coals within cer-



Dr. Reinhardt Thiessen, paleobotanist of the United States Bureau of Mines, examining a thin section of coal

tain ranges of rank or degrees of coalification.

The attritus is a mixture of coalified plant debris derived from any and all plant matter contributed to the deposit during the peat stage, macerated and comminuted through the agencies of micro-organisms, lower forms of animal life, and meteorological agencies, and subsequently consolidated and changed into coal. The attritus therefore contains much of the more resistant plant products. It is much duller in appearance than the anthraxylon, being usually of a dull gray color. It often has a striped appearance when intercalated with thin sheets of anthraxylon. Attritus is the continuous fundamental matter—the disperse medium—in which the anthraxylon is imbedded. When thin

sections are prepared from coal and examined under the microscope at low magnifications, the attritus appears as a granular grayish mass lodged between the more homogeneous dark red bands of anthraxylon. At a higher magnification—200 diameters or more—it is shown to consist of a number of different constituents. Its chief constituents are: degradation matter, small fragments of plant tissue, cuticles, spore and pollen exines (coats), resin particles and mineral matter. These constituents have been studied in peat and traced through all ranks of coal, so that their history is fairly well known.

Anthraxylon and attritus may be associated in coals or in particular bands of coal in all proportions from practically 100 per cent anthraxylon to



Figure 1. Block of coal from the Taggart bed, Roda mine, Price County, Kentucky. This block shows the banding as found in most coals. The black bands represent the anthraxylon, the grayish appearing coal between the anthraxylon bands represents the attritus. (Slightly less than natural size.) Figure 2. Thin cross section of coal showing anthraxylon and a small portion of attritus in lower part. Figure 3. Thin cross section of coal from the Upper Freeport bed, showing transparent attritus. In the upper part is embedded a thin strip of anthraxylon. The attritus is composed of humic degradation matter, shown in gray; resinous matter, shown as more or less oval particles; spore matter, shown as short thin white patches; opaque matter, shown as irregular black spots; and fusain represented at the left band middle of the figure.

100 per cent attritus. Cannel and bog-head coals consist almost entirely of attritus, whereas the ordinary "bright" coals are composed of varying proportions of anthraxylon and translucent attritus, and "splint" coals are composed of lesser amounts of anthraxylon associated with opaque attritus.

Up to the present time no one has laid down any definite system for classifying coal on the basis of relative percentages of anthraxylon and attritus as determined by actual measurement with the aid of the microscope. Such a system of classification is desirable in carbonization research because of the difference in coking properties of anthraxylon and attritus. It has been decided, therefore, to make arbitrary divisions of classification as follows:

Coals having a ratio of anthraxylon to attritus of more than 3:1 are called anthraxylous; those with a ratio between 3:1 and 1:1 are called anthraxylous-attrital; those with a ratio between 1:1 to 1:3 are called attrital-anthraxylous and coals in which the ratio of anthraxylon and attritus is less than 1:3 are called attrital. In other words, an anthraxylous coal consists of more than 75 per cent anthraxylon, and an attrital coal is more than 75 per cent attritus. It is believed that this system of classification

will be of some use in the comprehensive research which the Bureau of Mines is now conducting on the car-

bonizing properties of American coals in cooperation with the American Gas Association.

Munroe Award Applications Are Being Received

APPPLICATIONS for the Charles A. Munroe Award, which is a national recognition for achievement in the gas industry, are being received by the American Gas Association, 420 Lexington Avenue, N. Y. C. The award will be made to the individual who is found to have made the outstanding contribution toward the advancement of the gas industry during the period from July 1, 1930, to June 30, 1931.

Under the terms governing this Award, the most conspicuous contributions to the general interests of the gas industry may be presumed to include the following: Research invention, operating methods or practices which reduce cost of production, transmission and distribution, improved distribution or other service, increased sale of gas, development of new uses for gas, improved public and employee relations, promotion of safety, development of improved accounting practices, widening the field of gas making materials, new methods of manu-

facture, finance, publicity, new gas works products and by-products, rates, etc.

The Charles A. Munroe Award consists of a substantial financial recognition accompanied by an engrossed certificate to be presented at the annual convention to be held in Atlantic City, N. J., October 12-16, 1931. Applications should be filed with Alexander Forward, Managing Director, American Gas Association, 420 Lexington Avenue, N. Y. C., promptly and not later than August 15.

Last year the Munroe Award was presented to J. L. Conover of the Public Service Electric & Gas Company, Newark, N. J., in recognition of his work in contributing to the general interest of the gas industry by the introduction and widespread application of machine bookkeeping systems to practically every phase of public utility accounting, resulting in reduced costs, improved public relations and more efficient operation.

Camping Trips Through Industrial America

NEW YORK bankers have launched a movement to encourage young men to travel and learn by actual contact the greatness of their own country. These young men will follow the open road in motor trucks, experiencing the rigors of camping life and developing the traits of leadership and self-reliance.

The first of a series of expeditions started from Tuxedo, N. Y., last Spring with nine motor busses carrying nearly 100 young men between the ages of eighteen and twenty-five years. These young men were recruited from banks and other corporations in New York City.

Other expeditions followed the first, each lasting about six weeks. Recruits came from many walks of life.

The plan, which has been called an "Industrial Plattsburg," was originated and financed by the Thorne-Loomis Foundation, which was organized last year with the object of providing an opportunity for young men to see something of the industrial development of the country and to visit places of historical interest.

The first expeditions were sent out quietly last year, more or less as an experiment. The 1930 expeditions were so successful that ambitious plans have been laid for 1931 and future years.

The organizers of Thorne-Loomis Foundation, Inc., are Landon K. Thorne, president and director of Bonbright & Company, and Alfred Lee Loomis, vice-president and director.

The institu-

Thorne-Loomis Foundation Gives Young Men Insight Into Gas Service, Mining, Agriculture, Transportation

tions from which the young men come have joined enthusiastically in the scheme and will continue to pay the salaries of their employees during the six-week absence. The firms believe that their juniors will come back more useful and efficient employees as a result of the tour.

Elaborate plans have been prepared by the sponsors of the expeditions, although once on the road the young men will govern themselves under an appointed leader. They will select their own routes and the points of interest to be visited. The expeditions will set forth with some necessary introductions and papers of identification and suggested routes and camping grounds.

Each expedition will consist of one truck of ten boys and will run entirely independently of any other. The leader of each expedition will be responsible for picking the details of his route but each expedition will be

expected generally to follow the circle outlined by New York, Buffalo, Detroit, Chicago, St. Louis, Birmingham, Atlanta and Washington, D. C. They can decide in which direction to make this circle.

Detailed lists will be supplied to each leader giving suggested industries to visit together with the names of various people at the different plants to get in touch with.

Among the more interesting places suggested to be visited by the young men will be the United States Military Academy at West Point, Sing Sing Prison at Ossining, Ashokan Reservoir, West Hurley, N. Y., an important source of New York City's water supply; the Standard Oil Company of New York, Van Rensselaer Island plant in Albany, the Hudson Valley Fuel Corporation and the Cluett, Peabody Company in Troy, the Endicott-Johnson Corporation in Endicott, the General Electric Company, Schenectady; the Beechnut Packing Company, Canajoharie, N. Y., The Eastman Kodak Company in Rochester, the Pierce Arrow plants in Buffalo, the Bethlehem Steel Company plants in Bethlehem, Pa.; the Youngstown Sheet and Tube Company in Youngstown, Ohio; The Goodyear plants in Akron, the Diamond Match Company in Barberton, Ohio; the Ford plants in Detroit, the Corn Products plant in Chicago and the Reynolds Tobacco Company in Winston-Salem, N. C. This is mentioning only a few of the plants to be visited.

The young men will see manufactured and natural gas serving giant industrial plants, coal mined, cotton growing, ships loaded at the docks, railroad yards in operation, copper



Group of Expedition Leaders—Truck about to go into camp.



mined and smelted and all the other activities that go to make up the great industrial picture of the United States. Some of the expeditions expect to visit the United States Government hydro-electric plant at Muscle Shoals, to Lookout Mountain, the White House, Lincoln's tomb and many famous battlefields.

In 1930 the shortest trip covered slightly less than 1,000 miles and took approximately two weeks. The longest trip covered more than 6,000 miles and took thirty-five days. It was found on the experimental trips last year that more time would be required and so the trips were lengthened this year.

The automobiles used have been designed for the Thorne-Loomis Foundation. They are camps on wheels. The chassis and the engine are the same as those used in the latest Ford model AA commercial truck. The body has been designed to provide for comfortable living in good weather and bad. When camp has to be made the entire bus may be completely enclosed by heavy canvas and transformed into a spacious tent.

When on the road the bus rides smoothly at a normal speed of thirty to forty miles an hour. One bus fully loaded has made the run from New York to Wyoming in eight days, an average of 250 miles a day. The leader in each expedition is fully instructed in repair and emergency work and is directed to select from his crew the best drivers to work in relays. When camp is pitched at night orders are that two men must be left to guard the camp while others go sight-seeing.

The leader of each group is charged with the full responsibility for the success of the trip. He must make all decisions, and his associates will act as his "cabinet." In 1930 groups organized in this way were exceedingly successful. The members of these expeditions realizing that they were "on their own" learned self-reliance and resourcefulness. Each member of the expedition must keep a diary to be turned in at the offices of the foundation on return. It is the

policy of the foundation to allow the leaders of the different expeditions as much freedom in arranging their own trips and as much personal initiative in obtaining entrance to laboratories and industrial plants as possible.

The busses are finished for the expedition without cost. Members of the expedition help to defray living expenses but the cost to them will not exceed \$1.00 a day. The only other expense for the trip is the purchase at wholesale prices of suitable camping clothes. The busses are operated under an automobile fleet insurance policy issued by one of the largest insurance companies, insuring the foundation and the members of the expedition against liability to persons or property. Each member of the expedition will be required to supply a physician's certificate of health. To get the full mental and physical benefits of a trip, which is rigorous, a member must not be under par in any way.

The money each expedition takes is the property of the expedition and can be expended as the leader sees fit. He will divide the money left at the end of the trip equally between the members. Each leader will be supplied with a small pocket account book, and he will have to account for every penny spent. A great deal of rivalry is expected to see which expedition can save the greatest amount out of its budget. Two expeditions in 1930 made trips for less than \$1.50 a day per person.

Each expedition will carry along a manual giving detailed information on personal equipment, food and supplies, the budget, accident and first aid, and how to treat the bus and camping equipment.

The secretary of the Thorne-Loomis Foundation, Inc., is Miss Grace Ford. She may be addressed at 25 Nassau Street, New York City, and will be glad to give additional information on proposed trips.

Home Service Committee Work Discussed at Toronto

THE third meeting of the 1931 Home Service Committee met in Toronto, Canada, May 29, at the Consumers Gas Company with the chairman, Miss Karen Fladoes, of Pittsburgh, Pa., presiding. The group was welcomed by Arthur Hewitt, Vice-President and General Manager of the Consumers Gas Company and Vice-President of the American Gas Association. The final committee reports were read and discussed. The main activity of the year's work being a compilation of booklets to comprise a home service manual. The first booklet on *Home Calls*, prepared under the direction of Miss Hulda Ungericht, of the Columbus Gas and Fuel Company, Columbus, Ohio, will be available for distribution to Home Service Directors at an early date.

Another phase of work of the committee is the new project in home service work called "Kitchen Planning Service." Miss Dorothy Shank, of

the American Stove Company, Cleveland, is chairman of this committee. Miss Jane Callaghan, kitchen consultant for the Brooklyn Borough Gas Company, reported on her company's kitchen planning activities. Miss Ruth Kleinmaier, Central Hudson Gas & Electric Corp., who is doing a definite home modernization problem, and Mrs. Edith Lloyd, Philadelphia Gas Works, who is cooperating with architects bureaus in Philadelphia described their activities. Miss Grace Pennock, household engineer of the Delineator Institute, outlined a plan of consumer research which has started a definite kitchen modernization plan. This new phase of home service work originated in the Home Service Committee of the American Gas Association.

The group were guests at luncheon at the King Edward Hotel, as guests of the Consumers Gas Company through Mr. Hewitt.

Visual Inspection Of A. G. A. Coatings*

I. Introduction



Dr. Scott Ewing

THE visual inspection of the American Gas Association coatings was made on March 3, 4 and 5. The complete report on these coatings will not be available until about next September. While it is desirable to publish the results of this examination at the same time the other data on the specimens are published in order that a better understanding of the data may be obtained, this would necessitate a delay until next September or later. On the other hand, a number of pipe lines will be laid this spring and summer and the information resulting from the inspection may be helpful in the protection of these lines. On this account it seems best to publish the results of the inspection at this time, but to defer their discussion until the other data are available. The reader who is sufficiently interested will be able to draw his own conclusions as to the relative merits of the various coatings and their behavior underground. The symbols which are given in the first column of the table correspond with those in Table I of the article "Tests of Coated Pipe" in the *American Gas Journal* of May, 1930, and on page 269 of the A.G.A. MONTHLY for June, 1930. This table gives the methods used in applying the coatings, their trade names and the names of the manufacturers who submitted them. The coatings are arranged in order of their increasing thickness in the attached table. The ages of the specimens range between nine months and one year.

In preparation for the inspection half of the coating was peeled off each

By DR. SCOTT EWING,
American Gas Association Research
Associate

specimen and the pipe was wiped with rags soaked with carbon bisulphide until it was as nearly clean as possible. The specimens were then photographed and the bare pipe was coated with a thin film of "vaseline." The finished specimens were then stored in a heated building until all had been cleaned and photographed. On the day before the inspection work started the specimens were laid out on tables so that all of the specimens of one coating were in one group, together with an unexposed specimen of the same coating, when it was available, to be used for comparison.

Since there are certain attributes of any coating that are beyond any accurate method of measurement, the only way any indication of these attributes can be obtained is by a visual examination. The value of the results of such an examination depend not only upon the care with which the examination is made, but also upon the competence and impartiality of the observers, and whether or not these observers are able to reach agreement in their descriptions of the specimens. An examination of this type was made by three men who represented the organized coating manufacturers, the American Petroleum Institute and the American Gas Association. These men were chosen by their respective organizations as being well qualified for this work. Anyone familiar with the various types of coatings in the test might have been reasonably certain of the identity of a few, but the inspection was so arranged and carried out that it was practically impossible for any inspector to positively identify any coating at the time it was being inspected.

II. General Method of Inspection

With the help of the Bureau of Standards and the A.P.I. Research Associate a scheme for rating the speci-

mens was devised by the writer which involved classifying the coatings into several more or less distinct groups. This scheme was submitted to the three inspectors with the suggestion that they use it or modify it in any way they saw fit. The following is a description of the modified scheme which appeared to be necessary in order to adequately describe the coatings.

Before having any discussion among themselves or any instructions other than the proposed scheme of classification, the three inspectors spent about two hours rating 44 specimens. A comparison of the separate rating sheets showed that there was either some disagreement among the inspectors or that all did not have the same standards of comparison. It was then decided to discard the separate rating sheets and to attempt to make a single rating sheet, each inspector examining the same specimen at the same time and each showing the others the reasons for his views. The entire group of specimens was examined four times. At each examination only one effect of the exposure of the specimen was considered. The separate effects were rated in the order in which they are given in the next paragraph. In using this scheme complete agreement was reached on every specimen. The inspectors spent 22 hours in rating the specimens, not including time spent in discussion of the rating scheme. The coating adjacent to the cans or adjacent to the removed part was not considered in making the ratings.

Numerous notes were necessary to describe the peculiar conditions that were observed on the specimens. Reference numbers to these notes are inserted in the table. A "normal" specimen (one which can be described adequately by the rating symbols) is rated with three letters. These letters, in their order refer to (1) effects on the coatings due to causes which are not mechanical in nature, (2) effects on the coating caused by mechanical forces (soil stress), (3) the condition of the pipe where the coating had been removed. If the coating includes a fabric, the rating symbols include a number (1, 2, 3) which refers to the condition of the fabric. Hence the complete rating

* Publication approved by the Director of the Bureau of Standards of the U. S. Department of Commerce.

of a normal coating containing a fabric might be Abr2.

III. Description of the Symbols

1. Effects not mechanical. Those phenomena which are not mechanical include the effect of temperature, and of chemical changes in the coating brought about by its exposure to the soil and moisture. These effects have been classified as follows:

A. Unaltered. The specimen ap-

pears practically the same as the original specimen as far as these effects are concerned.

B. Dulled. The original appearance of the surface has changed in the same way that a paint or bituminous surface changes on weathering. The dulling may also be the effect of the application of kraft paper as a wrapper.

C. Cracked. Wherever this symbol occurs the coating has cracks in it.

The cracks may or may not extend to the pipe. Many of these cracks in the enamels are probably caused by temperature changes. The cracks in the asphalt coating may not be caused by chemical changes or temperature but it is the opinion of the inspectors that most of them are weathering or allied phenomena.

D. Pulverized. This is the last stage in the weathering of a bitumen.

RATING OF A.G.A. PIPE COATINGS

Inspectors: P. J. Richards, J. H. Peper and J. K. Crowell
(Coatings arranged in order of increasing thickness)

		Set Number, Location and Soil											
Coating* Symbol	Notes† refer to entire group	2 Elrama, Pa., Cinders (Dry)	8 Milwaukee, Wis., Cinders (Wet)	12 Brooklyn, Mass., Tidal Marsh	16 Atlantic City, N. J., Tidal Marsh	18 West Palm Beach, Fla., Muck	23 Miami, Fla., Muck	26 Atlanta, Ga., Cecil Clay Loam	30 Raleigh, N. C., Cecil Clay Loam	34 Shreveport, La., Susquehanna Clay Loam	39 Shreveport, La., Miller Clay	44 Ersan, Texas, Miller Clay	
SS	6	dp ¹	dp ¹	Bdr ²	Bdr ²	Bdr ²	Bdr ²	Bdr ²	Bdr ²	Bdr ²	Bdr ²	Bdr ²	
K		dp ¹	dp ¹	Bdr	Bdr	Bdr	Bdr	Bdr	Bdr	Bdr	Bdr	Bdr	
M		Bdp	Bdp	Adr	Bdr	Bdr	Bdr	Bdr	Bdr	Bdr	Bdr	Bdr	
C		Bdp	Bdp	Bar	Bdr	Bdr	Bbr	Bdr	Bdr	Bdr	Bdr	Bdr	
G		Bdp ³	Bdp ³	Bdr	Bdp	Bdr ³	Bdr	Bdr	Bdr	Bdr	Bdr	Bdr	
L	4	Aap	Bdp	Aar	Aar	Aar	Aar	Aar	Adr	Aar	Aar	Adr	
FF		Bdp ³	Bdp ³	Bdr	Bdr	Bdr	Bdr	Bdr	Bdr	Bdr	Bdr	Bdr	
H		Bbr ⁵	Bbr ⁵	Ab ⁵	Ab ⁵	Bbr ⁵	Bbr	Cbg	Bbg ⁵	Bbg ⁵	Bbr ⁵	Bbr ⁵	
S		Bdg	Bdp	Bcg	Bcg	Bdg	Bdg	Bdg	Bdg	Bdg	Bdr	Bdr	
B		Bdr	Bdg	Bdg	Bcg	Bcg	Bcg	Bdg	Bdg	Bdg	Bdr	Bdr	
VV	67	Bdr 1†	Bdr 1	Aar 1	Bar 1	_____	Bdr 1	Bdr 1	Bbr 1	Bbr 1	Ber 1	Ber 1	
VX	6	Bbg 1	Bdp 1	Bag 1	Bbg 1	_____	Bcg 1	Bcr 1 ⁷	Bbg 1	Bcg 1	Bcg 1	Bdg 1	
E		Bbg	Bdr	Bdr	Bcr	Cdr	Cdr	Bdr	Cdr	Cdr	Cdr	Cdr	
WR		Aag	Bdp	Aag	Abg	_____	Bdg	Bcg	Ccg	Ccg	Cdr	Ccg	
Q	78	Adr 3	Adr 3	Adr 3	Adr 3	Adr 3	Adr 3	Adr 3	Adr 3	Adr 3	Adr 3	Adr 3	
WL	9	Bb	Bc	Bb	Cb	_____	Bc	Bc	C ¹²	Bd	Cc	Bdr	
D	78	Adr 1	Adp 3	br 1 ¹³	br 1 ¹³	br 1 ¹³	br 1 ¹³	Ac 1	Ac 1	Ac 1	Ac 1	Ac 1	
LL	7	Ab ^{10 11}	Ab ¹¹	Ab ¹	Ac 1 ¹¹	Adr 3 ^{10 11}	Abg 3 ¹¹	Ad 1	Ac 1 ¹¹	Ac 1	Ac 1 ¹¹	Ac 1 ¹¹	
W		Aag	Abg	Aag	Aag	Aar	Aar	Aag	Acg	Acg	Acg	Acg	
EE		Adr ¹	Adr ¹⁰	Aar	Aar	Aar ¹⁷	Ac 1	Aar	Ac 1 ¹⁸	Acg	Adr	Adr	
R	14	Cag	Cbr	Aag	Cag	Aag	Aag	Car	Car	Cbg	Cbr	Car	
V		Aag	Abg	Aag	Aag	Abg	Abg	Abg	Abg	Abg	Cdr	Adr	
DD	67	Bbr 1	Bbr 1	Bar 1	Bar 1	_____	Bbr 1	Bbr 1	Bbr 1	Cer 1	Cer 1	Cer 1	
MM	67	Ab ¹	Cdp 3 ¹⁶	Cbr 1 ¹³	Ccr 1 ^{13 18}	Cbr 1 ¹³	Car 1 ¹³	Car 1	Aar 1	Car 1	Cdr 3	Ac 1	
F	7	Bar 1	Ber 1 ^{15 6}	Ber 2	Ber 2	Ber 2	Bbr 1 ^{16 6}	Bbr 1	Bbr 2	Bcr 2	Bdr	Ber 2	
WW		Bdr	Bdr ¹⁶	Bcr	Bcr	Bbr	Bcr	Bdr	Bdr	Bcr	Bdr	Bdr	
Y	19 20	Ag 1	Ar 1 ²⁹	Ag 1	Ag 1	Ag 1	Ag 1	Ag 1	Ag 1	Ag 1	Ag 1	Ag 1	
NL	6	Bbr 1 ⁷	Bbr 1	Abg 1	Abg 1	_____	Bcg 1	Bcr 1 ⁷	Bcg 1 ⁷	Ccg 1	Cer 1	Cer 1	
Z	69	Ca 1 ¹¹	Cer 1 ¹¹	a 1 ^{22 23}	Ca 1 ^{11 24}	Cc 1 ¹¹	Cc 1 ¹¹	a 1 ²²	Cb 1 ¹¹	Cc 1 ¹¹	Cc 1 ¹¹	b 1 ²²	
CC	21 630	Bag 1 ^{11 22}	Bbg 1 ^{11 22}	ag 1 ²²	bg 1 ²²	Bg 1 ²²	Bg 1 ²²	cg 1 ²²	cg 1 ²²	cg 1 ²²	Bcg 1 ^{11 22}	cg 1 ²²	
P	67	Aar 1	Aar 1	Aar 1	Aar 1	Aar 1	Aar 1	Aar 1	Aar 1	Aar 1	Aar 1	Aar 1	
X	67	Bbr 1 ¹¹	Bbr 1 ¹¹	Ar 1 ²²	Bbr 1 ¹¹	Ccr 1 ¹¹	Bcr 1 ¹¹	Cbr 1 ¹¹	Bbr 1 ¹¹	Bbr 1 ¹¹	Bcr 1 ¹¹	Ar 1 ²²	
JJ	6	Bcr 1 ⁷	Bcr 1 ⁷	Bbr 1 ⁷	Bar 1	Bbr 1	Bbr 1	Bbr 1	Bbr 1	Bbr 1	Bcr 1	Bcr 1	
NT		Bag	Cdg	Aag	Cag	Cbr	Ccg	Bcr 1 ⁷	Bcg 1	Bcr 1 ⁷	cr 1 ^{28 7}	Cer 1	
BB	6	Cbg 1 ¹¹	Ccg 1 ¹¹	Aar 1 ⁷	Cag 1 ¹¹	Bcr 1 ^{7 11}	Bcr 1 ^{7 11}	Bcg 1 ¹¹	Cbg 1 ¹¹	Bbg 1 ¹¹	Bcr 1 ^{7 11}	Aar 1 ⁷	
N	6	Cbg 1 ¹¹	Ccr 1 ⁷	Ar 1 ^{7 22}	Aar 1 ⁷	Bcr 1 ^{7 11}	Cbr 1 ^{7 11}	Ar 1 ^{7 22}	Cbr 1 ^{7 11}	Ccr 1 ^{7 11}	Ccr 1 ^{7 11}	Ar 1 ^{7 22}	
TS	67	g 1 ²⁶	g 1 ²⁶	r 1 ²⁶	g 1 ²⁶	r 1 ²⁶	r 1 ²⁶	g 1 ²⁶	g 1 ²⁶	r 1 ²⁶	r 1 ²⁷	r 1 ²⁶	
WF		Cbr 1 ¹¹	Cbr 1 ¹¹	Ar 1 ²²	Car 1 ¹¹	Cer 1 ¹¹	Cbr 1 ¹¹	Ar 1 ²²	Car 1 ¹¹	Cbr 1 ¹¹	Ccr 1 ¹¹	Ar 1 ²²	
J	6	Aag 1	Aag 1	Aag 1	Aag 1	_____	Acg 2	Aag 1	Acg 2	Acg 2	Acg 2	Acg 2	
U		Bbg 1	Bcg 1	Bcg 1	Bcg 1	Bcg 1	Bcg 1	Bcg 1	Bcg 1	Bcg 1 ²⁸	Bcg 1	Bcg 1	
		Aag 1 ¹¹	Abg 1 ¹¹	Aag 1	Aag 1 ¹¹	Acg 2 ¹¹	Acg 2 ¹¹	Aag 1 ¹¹	Aag 1 ¹¹	Acg 2 ¹¹	Acg 2 ¹¹	Acg 2 ¹¹	

*The identification of the coatings is given in the references in Part I.

†The small figures refer to the notes which follow.

‡The large figures refer to condition of fabric.

A—Unaltered

B—Dulled

C—Cracked

D—Pulverized

a—Unaffected

b—Roughened

c—Distorted

d—Penetrated

g—No rust visible

r—Unmistakable rust stains

p—Pitted

1—Intact

2—Wrinkled

3—Not intact

NOTES ON VISUAL INSPECTION AS GIVEN IN TABLE OF RATINGS OF SPECIMENS

¹On the top where considerable pitting and rusting had occurred the coating was pulverized and the bond was poor. On the bottom, the soil not having contact with the coating had not affected the coating and the bond was adequate.

²Unweathered on bottom, dulled on top.

³Coating pulverized in a few small areas.

⁴Nature of coating makes it difficult to judge penetration.

⁵Penetration caused by bubbles.

⁶Wherever there is bitumen over fabric the fabric is classed as intact because it is impossible to do otherwise.

⁷Spiral rust mark on bare pipe.

⁸Brushing in cleaning makes it difficult to judge distortion.

⁹Red lead adheres to pipe and covers any possible rust.

¹⁰Where asphalt has seeped through paper it has been slightly dulled.

¹¹Kraft paper gone.

¹²Penetrated to red lead.

¹³Appear unweathered except color has changed from brown to almost black.

¹⁴Rust appears as thin lines probably at the bottom of cracks.

¹⁵Where bitumen has seeped through fabric it is pulverized in places and coating has a grooved appearance.

¹⁶Penetration not due to distortion.

¹⁷Cement off.

¹⁸Distortion apparently due to clod.

¹⁹Wood veneer was rated as for fabrics.

²⁰Bitumen is thinned at overlap in veneer by an amount equal to thickness of veneer. When veneer was taken off found rust on pipe in numbers 8 and 26.

²¹Weathering refers to condition of that part of coating which was originally under Kraft paper.

²²Spiral crack in bitumen at overlap in Kraft. Crack less distinct where Kraft is gone. Bitumen not rated for weathering where Kraft paper is on coating.

²³Red lead changed to maroon color.

²⁴Red lead disappeared.

²⁵Asphalt under steel discolored with rust from outer fabric but no evidence of distortion or disintegration.

²⁶Steel wrapper penetrated.

²⁷Steel wrapper rusted but not penetrated.

²⁸Honeycombed (distortion).

²⁹Large rust spot adjoining the end.

³⁰Application of Kraft dulled bitumen surface.

2. Mechanical effects (soil stress)
 - a. Unaffected.
 - b. Roughened. The first mild stages of distortion.
 - c. Distorted but not penetrated by mechanical causes.
 - d. Penetrated. In case there was any question as to whether or not a penetration was due to an abrasion, the coating was always given the benefit of the doubt.
3. Condition of the pipe.
 - g. No rust visible on careful examination.
 - r. Unmistakable rust stains on surface of pipe but no pits over .020 inch.
 - p. pitted.
4. Condition of fabric.
 1. Intact.
 2. Wrinkled.
 3. Not intact.

The information which one is able to obtain by a visual inspection of the fabric in a coating is not entirely adequate. It is the opinion of the inspectors that it is possible to tell whether or not the fabric has deteriorated to such an extent that it is not intact, but it is not possible to tell whether it has partially rotted if it is still in place. If the fabric is on the exterior of the coating, one can see whether it has been wrinkled or sagged, but if it is covered with a layer of bitumen, wrinkling cannot be determined with certainty. The special notes which accompany the rating sheet explain the conditions which are peculiar to each coating.

5. Bond. No statement as to the condition of the bond is included in the rating table. The inspectors are aware that a good bond is considered one of the necessary requirements of a good pipe coating. They are also familiar with the ordinary methods that are used to test the bond. These methods and several other improvised methods were tried on many of the specimens. It is possible to notice differences in the way the coatings adhere to and split or separate from the pipe. In the treatment of the specimens before they were inspected, the pipe was heated where the cans and part of the coating were removed. This

might have affected the condition of the bond. It was noticed that on some specimens where the pipe was covered with rust, the bond appeared to be excellent. Considering these facts and the wide variety of coatings in the test, it is the opinion of the inspectors that the bond on all specimens was adequate, and that any statement to the effect that the bond on one specimen was better than that on another would be difficult to justify.

Any one using the rating as a basis for the selection of a protective coating should bear in mind the fact that but one specimen of each material in each soil was examined and that any specimen may have been imperfect or exposed to abnormal soil conditions. There is also a possibility of errors by the inspectors in making some of their observations. Any conclusions as to the relative merits of the materials should be regarded as tentative and subject to revision when additional data are available.

Bibliography of Selected Articles Economics of Natural Gas Transmission

Prepared by LUIS HILT, Librarian American Gas Association

LONG distance gas transmission—H. C. Cooper (A. G. A.)—*Transactions of Fuel Conf., World Power Conf.* 1928: III—840-54.

Leakage from high-pressure natural gas transmission lines—U. S. Bureau of Mines *Bulletin* 265—E. L. Rawlins & L. D. Wosk, 1928.

Facts concerning the life of pipe—R. G. Griswold—A. G. A. Dist. Conf. Paper 1928; Same, *American Gas Assn. Monthly*, March 1928: 172-6 & 181-2.

Tapered pipe line for gas transportation—L. T. Jones—Pacific Coast Gas Assn. *Proceedings*, 1929: 429-43.

Selection of economical transmission pressure—(Part of report of Committee on natural gas transmission pipe lines)—Pacific Coast Gas Assn. *Proceedings* 1929: 380-1.

Economics of high-pressure transportation for natural gas pipe lines—P. McDonald Biddison—A. S. M. E. *Transactions*, 1929: Pet. 51-5.

Design of high-pressure gas pipe lines—R. E. Davis & L. F. Terry—Paper for *Amer. Inst. Mining & Met. Engrs.*, Feb. 1929; Same, *Oil & Gas Jrl.*, Jan. 1, 1931: 117-20.

Pipe welding and laying methods on 250 mile gas line—*Eng. News-Record*, July 11, 1929: 54-6.

Economics of pipe protection—S. W. Binkley—Pacific Coast Gas Assn. *Proceedings* 1930: 484-97.

Economics of protective coatings—LeRoy Sloan & Ralph U. Fitting—Pacific Coast Gas Assn. *Proceedings* 1930: 498-506.

Natural gas to the fore in Western fuel markets—*Eng. News-Record*, March 27, 1930: 527-30.

Economics of natural gas distribution—Part of Report of Federal Oil Conservation Board, May 28, 1930; Also, *Natural Gas*, June 1930: 10-1.

Design and construction of pipe lines for the transmission of gas—J. A. Messenger—*Amer. Gas Jrl.*, July 1930: 37-42; Same, *Gas Age* 66: 163-8, Aug. 2, 1930.

Mathematical investigation of the economics of natural gas transportation—A discussion by H. R. Davis (pages 268-75) following a paper—*Some aspects of high-pressure natural gas transportation*, by R. S. Lord—*Jrl. of Western Soc. of Engrs.*, August 1930: 254-68.

Gas pipe line factors effecting a minimum cost—W. R. Kepler—*American Gas Assn. Proceedings* 1930: 797; Same, *Gas Age* 66: 709-14 & 726-8, Nov. 1, 1930; *Western Gas*, Nov. & Dec. 1930: 23-7 & 32-7; *Pipe Line News*, Jan. 1931: 26-31 & 54.

Long-distance transportation of natural gas—E. G. Hill & G. I. Rhodes—*American Gas Assn. Proceedings* 1930: 288; Same, *Gas Age* 66: 745-50 & 752, Nov. 8, 1930.

Natural gas; an appraisal of its accomplishments and future—W. G. von Gemmingen—*Eng. News-Record*, Feb. 5, 1931: 232-6.

Comparative cost of gas and electric transmission—C. C. Brown—*Gas Age* 67: 419, March 21, 1931.

Economics of increasing capacity of gas pipe lines—L. C. Lichty & R. L. Anthony—*Amer. Gas Assn. Monthly*, April 1931: 160-1.

Compression and transmission of gas—P. McDonald Biddison—A. G. A. *Natural Gas Dept. Proceedings* 1931; Same, *Oil & Gas Jrl.*, May 14, 1931: 25 & 103-5; *Natural Gas*, June 1931: 12-15, 74 & 76.

European Study

MISS Dorothy Dignam, of N. W. Ayer & Son, Inc., Philadelphia, Pa., is visiting Norway, Sweden and Denmark to study home conditions of the people using utility service in those countries. Miss Dignam is particularly interested in gathering material for a complete illustrated lecture on house heating, using the various fuels, gas, coal, oil and electricity. Miss Dignam gave a lecture on "Home Service in Europe" before the Commercial Section, American Gas Association in 1930. She also has had several articles on "Home Service Abroad" published in the *Gas Age-Record*.

Gas Progress



E. S. Pettyjohn

PROGRESS in industry is normally stated in terms of the quantity or the quality of the service rendered. The remarkable growth of the gas industry during the thirty years of the present century testifies to the quality and reliability of gas service. The extent of this growth can easily be expressed in the increase in the number of domestic consumers served. But you who are of this number are more apt to consider progress from the standpoint of your experience. And it is through this experience that I wish to present the progress of the gas industry to you.

If you were asked the question, why do you use gas, the most probable answer which would come from your experience would be that gas is a great convenience. This greater convenience of gas is generally recognized at present but this has not always been the case. If we go back thirty years we find a marked difference in the extent to which gas could be and was used in the American home.

Saturday was the big day of the week. The woodbox or coal scuttle, depending upon the family budget, had to be filled. The more pretentious sifted and carried out the ashes from the coal or wood-burning furnace in the basement. The less fortunate polished the round oak stove in the sitting room and were very careful not to disturb the stove pipe lest that scatter soot throughout the room, or to break the isinglass in the stove door through which a glimpse of the burning coals could be had as isinglass was a luxury.

In the kitchen, the Sunday dinner was already in preparation and the old range would glow with a red heat and would consume fuel almost as fast as it could be carried in. Those kitchen ranges were ambitious old things. They not only heated the food

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but they heated themselves, the room and anyone who came near them. In the evening the old tin bathtub was brought up from the cellar and placed on the floor in the center of the kitchen, for the kitchen was the one room in the house warm enough to bathe in. The tub was partially filled with cold water and just enough hot water added from the basin or kettle on the back of the kitchen stove to take the chill off. Then one by one, from the youngest to the eldest and after much waiting for water to warm in between, the weekly baths were taken.

Not many conveniences in those days. The only service supplied by gas was the fish-tail flame of the gas jet which flickered in the steamy atmosphere and lighted weary faces and tired eyes. But this one service supplied by the gas industry in 1901 amounted to 101,625,366,000 cu.ft. of gas.

Nine years later some modernization of the home has taken place. The gas jet has given way to the incandescent mantle and homes are more brilliantly illuminated. Furnaces are found in a greater number of homes and all the rooms are heated; not any too well but still there is a register in the corner from which a small stream of slightly warmed air may be coaxed if the wind outside is from the right direction. The bathroom has moved upstairs and has a beautiful zinc- or copper-lined tub handsomely painted gray. The bathtub boasts of hot and cold water taps and while the hot water top is more ornamental than useful its presence is encouraging. On Saturday night the kerosene heater is lighted and placed in the bathroom to supply the deficiencies of the warm air register and all is ready for the weekly ablution. A stream of water feebly warmed by the hot water coil in the furnace trickles into the gorgeous zinc tub. This supply must be augmented from the kettle or basin on the kitchen stove. It is the same old round with one exception. The kitchen stove is no longer the old coal or wood-fired

range. It is a gas-fired stove with top burners and a baking oven. The wood box and coal scuttle are gone. A new service is supplied by gas and the reason is greater convenience. With this new service the sale of gas increased until in 1910 it amounted to 149,430,549,000 cu.ft., an increase of almost 50 per cent in nine years.

During the next decade the modernization of the home was markedly accelerated. The incandescent mantle has given way to the tungsten-filament lamp. The zinc-lined bathtub has been replaced by the enameled cast iron tub and the hot water tap really supplies hot water from the gas-fired copper coil water and storage tank. Thermostats have been developed to control the temperature and to insure an adequate supply of hot water. And this ever-present supply of hot water has materially changed the appearance of the home and its occupants. Everything is cleaner and brighter. The weekly bath has become at least a bi-weekly, if not a daily affair and there is some talk of a new way of bathing—standing up to bathe which is quicker, cleaner and leaves no tell-tale ring. The shower bath is just around the corner. Whiskers, beards and mustaches are rapidly disappearing with hot water available for the morning shave. Saturday is no longer the big day of the week and the labors of Monday washday are being alleviated with the aid of hot water. The thrice daily washing of the dishes has become materially facilitated as they may be quickly scalded with boiling hot water. Hot water has become a true servant of the home, making it possible to do the old tasks more quickly and easily so that women are beginning to have some time in which to enjoy living.

There have been other changes, the most obvious being the redesigning of the kitchen stove so as to place the baking oven on a level with the top burners. It is no longer necessary to get down on hands and knees with wax taper or twist of newspaper to light the baking oven. No bending of tired backs to remove bread pans or roasts. The oven is table high and easily accessible and baking is almost a pleasure.

Through these changes we see one predominating feature, a greater com-

* Radio address delivered over Station WJR, Detroit, Mich.

fort in the home through the greater increase in conveniences in the use of gas. The extent of this increase in convenience is more greatly emphasized when we notice the remarkable growth in the use of gas during the ten-year period. In 1920, 319,888,000 cu.ft. of gas were distributed in the United States, an increase of more than 100 per cent in ten years.

From 1920 to the present time the complete modernization of the home has taken place. A gas-fired appliance is available to the domestic consumer to perform nearly every task in the household. Gas water heaters have become a fixture in the American home and the daily or twice daily shower bath for each member of the family is customary. One may truly say that the American people are the cleanest people in the world and they should be, because it is more convenient for an American to bathe with his modern shower baths and ever present hot water than it is for any other human being.

There is not a place in the home where gas has not penetrated. In the living room, the radiant fire has replaced the andirons and wood basket. In the laundry, the water in the washing machine is heated with a gas burner while the clothes are being washed. The same clothes are dried in a gas-heated clothes drier regardless of weather conditions and then pressed with a gas-heated mangle. The kitchen presents a new appearance with the silent automatic gas-fired refrigerator replacing the old ice box—no ice-man with muddy feet and no noise. One gas company alone installed 32,423 of these gas-fired refrigerators last year during the big depression. The gas-fired incinerator has replaced the old garbage can which was a source of disagreeable odors and a breeding place for disease. Even the kitchen stove has been remodeled. The old sombre black has been replaced by attractively tinted enamel which harmonizes with the interior of the kitchen. New type burners which give complete combustion regardless of the height of the flame have replaced the old type burners. The pilot light which eliminated the match has in turn given way to the insta-matic or self-igniting burner. A turn of the control and either top

burner or oven burner is immediately and automatically lighted. The oven is insulated and equipped with a temperature regulator. It is no longer necessary to supervise the cooking of the family dinner. With the new heat regulator, self-igniting burner and automatic control the food is placed in the oven, the temperature regulator set for the proper heat and the automatic control adjusted for the desired length of cooking period. Gas does the rest. The oven automatically turns on, comes to the proper temperature, cooks the food and then shuts off so that all that remains is to place the dinner on the table and then eat it. This is all quite in contrast with the old kitchen range and markedly demonstrates the increasing convenience in the use of gas.

As a final step, gas is heating the home. The necessity of following the sun in order to have warm, fresh and clean air the year around is gone. Through the introduction of gas for house heating, with forced circulation and humidity control, the air in our homes is clean and fresh and contains the proper percentage of moisture. The winter season is no longer a period both disagreeable and unhealthy when parched noses and throats and dry skin invite the flu and other infectious diseases. The furniture does not creak with every move due to prolonged exposure to dry atmospheres nor do streaks of grime appear above the warm air registers. The coal and ash men with their dust and dirt have been succeeded by a slender unobtrusive pipe. And the coal bin and furnace room are now used for recreation. The same equipment which is used to circulate and humidify the air is now being adopted to dehumidifying and cool the air so that we may be protected from the heat of summer. Within ten years' time our homes will be built with windows for light only and we will create our climate indoors to suit our convenience with this automatic temperature and humidity control.

These new uses of gas have been accepted and are a true measure of gas progress. In 1929, 578,304,000 cu.ft. of gas were distributed by the gas industry in the United States, an increase of 81 per cent in nine years. Of this huge total 358,900,000,000

cu.ft. were used in the homes of domestic consumers. During the past year when other industries have suffered losses in production of from 10 to 50 per cent, the gas industry has maintained its position. While statistics are available for only the first ten months of 1930, they show that there has been a decline of but two-tenths of one per cent in the quantity of gas sold. This remarkable showing is the result of the degree to which the domestic consumer relies upon the convenience of gas service to perform the many tasks in the home. It definitely places gas as a necessity and a great convenience which cannot be sacrificed. Cooking, water heating, incineration, refrigeration and house heating are all more conveniently accomplished with gas. There is no question as to the desirability of using gas for this last purpose. It is only a consideration of the cost. When the practical benefits to be gained in using gas for house heating are included as well as the intangible benefits, the cost is not prohibitive. This cost is gradually being lowered and the decrease can be accelerated by a continuation of the increase in the consumption of gas by the individual consumer, an increase which has contributed to the present reduction in cost per unit sold.

Gas is always on hand, is always available and is ready to extend its great convenience to your home as it has to the more than twelve million homes which it is serving at present. The substitution of gas for other fuels in domestic service is a true presentation of gas progress and a comparison of the conveniences of your modern appliances with those of thirty years ago is a tribute to and an appreciation of a great industry, an industry which exists through the convenience of its service, a service which has made life more pleasant, more comfortable and more healthful for the American people.

A Correction

INFORMATION received from Philadelphia states that the Atlantic Refining Co. is not yet ready to distribute butane in unlimited quantities outside of Philadelphia. How soon production will be available has not been definitely stated.

Oklahoma Gas Rate Situation Adjusted

GOVERNOR William H. Murray of Oklahoma, on June 11, ordered dismissed from the State Supreme Court his suit against the Oklahoma Natural Gas Corporation seeking to have the company ousted from the state and a receiver appointed.

At the same time the Oklahoma Corporation Commission cancelled its order, made last February, calling for a reduction of 10 cents per thousand cubic feet in Oklahoma natural's gas rate.

This action on the part of the commission resulted in Oklahoma natural withdrawing its suit, filed in the Federal Court, restraining the Corporation Commission from putting into effect its 10 cent blanket reduction.

These three important developments resulted from a series of conferences between Oklahoma natural officials and Governor Murray and the Corporation Commission. They signaled the clearing up of a situation that has been tense in Oklahoma for some years.

The announcement was met throughout Oklahoma with general public approval and the *Tulsa World* editorially commented upon the development as follows:

"We are glad that there is no serious danger of a campaign of corporation baiting. Of all forms of political enterprise we are inclined to think corporation baiting is the worst. It afflicts capital and business, reacts upon labor, and, in the long run, oppresses the middle element, the great consuming public. In the case of the Oklahoma Natural Gas Corporation, particularly, we see many useful and creditable services. It must be remembered that the gas company was a real pioneer in the development of Oklahoma industry and in the settlement and development of most of the towns and cities. The gas concerns have spent many millions of dollars buying land, building plants, developing distribution and maintaining systems wherever there was demand. Through boom times and depressions, through excitement and calm, through every sort of rapid development, the gas service has, in the main, been dependable and steady. Certainly no right-minded Oklahoman should wish to

oppress or harass the gas developers and distributors."

Oklahoma natural came forward with a voluntary rate reduction which became effective July 1. The new rate is established at 50 cents per 1,000 cu.ft. for all residential and commercial consumers in the first 100,000 cu.ft. block now in excess of 50 cents. The reduction ranges from former rates of 64 to 57 cents in many of the towns served by Oklahoma natural. To the consumers of Oklahoma this will mean a saving of approximately \$930,000.

In the cities and towns where Oklahoma natural does not distribute gas the rate is reduced to 25 cents at the gate. It previously was 35 cents. In those Oklahoma cities and towns where there has been a gross receipts tax levied against Oklahoma natural the company continues the tax and it is added to the rate charged in those particular communities.

A series of conferences preceded the numerous developments in the Oklahoma situation. The conferees were E. A. Olsen, executive vice-president, and Judge R. C. Allen, attorney for Oklahoma natural, while the state was represented by Governor Murray and Chairman Paul Walker, of the Corporation Commission.

In a public statement, Mr. Olsen said, "Although the reduction means a great sacrifice to the company, it was thought advisable to make it effective at this time when economic conditions have caused a general downward trend of commodity prices.

"Already with the lowest rates offered by any large pipe line company operating under comparable conditions, the Oklahoma natural, as a result of rigid economies already effected and which must continue, is making this further cut in rates in the belief that it will result in increased consumption to compensate for the immediate loss in revenue.

"We have a nation-wide reputation for excellency and dependability of

service. It shall be our constant aim to continue the service at this same high standard even under the new price conditions.

"For several months we have been steadily reducing our operating expenses with a view to passing the saving on to our consumers. We have had to cut corners and shave off edges. We are doing what every housewife in America is doing—and we shall have to continue to economize on the new rate. We are happy, however, to do our part, and will make a strenuous effort to continue to give the kind of gas service that has played so constructive a part in the upbuilding of our great state of Oklahoma.

"We have met the economic situation with cheerfulness and optimism. We have confidence in our ability to increase our volume of business commensurate with the decreased rate. Had we not had this confidence, we could not have planned a rate reduction."

In discussing the results, Governor Murray said, "I found a willingness on the part of the company's officials to comply with the law and to cooperate with the executive and the Corporation Commission in establishing equitable rates. Candor also constrains me to say that I believe, in the future, the people of the state and of the municipalities may now safely deal with the Oklahoma Natural Gas Corporation with reasonable assurance of its meeting their just claims; and that is all we could honestly ask.

"This reduction is voluntary on the part of Oklahoma Natural Gas Corporation and grows out of the various proceedings before the Corporation Commission and the Supreme Court of the state."

Changes in Personnel

AN important change in the form of organization of the offices and personnel of the Oklahoma Natural Gas Corporation was announced

(Continued on page 313)

Executive Officers of Affiliated Associations



*Herbert E. Cliff
Sec.-Treas.
New Jersey Gas
Assn.*



*G. H. Schlatter
Sec.-Treas.
Southern Gas Assn.*



*E. N. Willis
Secretary
Southwestern Pub.
Service Assn.*



*John N. Cadby
Exec. Sec.
Wisconsin Utilities
Assn.*



*Roy B. Searing
Sec.-Treas.
Mid-West Gas Assn.*



*Geo. W. Schwaner
Sec.-Treas.
Illinois Gas Assn.*



*A. G. Schroeder
Sec.-Treas.
Michigan Gas Assn.*



*C. D. Williams
Exec. Sec.
New England Gas
Assn.*



*Wm. H. Thompson
Sec.-Treas.
Ohio Gas & Oil
Men's Assn.*



*Edward F. McKay
Manager
Oklahoma Utilities
Assn.*



*Clifford Johnstone
Managing Director
Pacific Coast Gas
Assn.*



*F. W. Lesley
Sec.-Treas.
Pennsylvania Gas
Assn.*



*Geo. W. Allen
Sec.-Treas.
Canadian Gas Assn.*



*P. A. McLeod
Sec.-Treas.
Indiana Gas Assn.*



*B. H. Smyers
Sec.-Treas.
Penn. Natural Gas
Men's Assn.*



*Jesse Blythe
Asst. Sec.
Missouri Assn. of
Public Utilities*

Affiliated Association Activities

Convention Calendar

Michigan Gas Association,
Grand Hotel,
Mackinac Island, Mich.
June 30 to July 2.

Home Service Summer Course,
Columbia University,
New York, N. Y.
July 6 to 24.

Pacific Coast Gas Association,
San Francisco, Calif.
Aug. 31 to Sept. 5.

Wisconsin Utilities Assn. Gas Section,
Sheboygan, Wis.
September 10 and 11.

American Trade Association Execu-
tives,
Grove Park Inn,
Asheville, N. C.
September 23 to 26.

Appliance Division, Mfrs. Section,
A. G. A.,
Book-Cadillac Hotel,
Detroit, Mich.
Sept. 17 and 18.

American Electric Railway Associa-
tion,
Atlantic City, N. J.
September 26 to October 2.

American Gas Association,
Atlantic City, N. J.
October 12 to 16.

Nat'l Assn. of Railroad & Utilities
Commissioners,
Richmond, Va.
October 20 to 23.

American Petroleum Institute,
Stevens Hotel,
Chicago, Ill.
Nov. 10 to 12.

Bituminous Coal Conference,
Pittsburgh, Pa.
November 16 to 21.

Utility Association Secretaries,
Milwaukee, Wis.
Nov. 30 and Dec. 1.

Canadian Gas Association

A RECORD-BREAKING attendance heard with pleasure that the output of manufactured gas in Canada during 1930 exceeded the production of 1929 by about a hundred million cubic feet, when 209 delegates assembled at Montreal, June 4 and 5, to participate in the twenty-fourth annual meeting of the Canadian Gas Association. This was said to be the largest registration of delegates in the association's history.

The report from the Canadian industry was a particularly encouraging feature of an unusually interesting program. Prominent men presented excellent papers covering many timely subjects. Discussions centered around distribution and house-heating problems.

Business sessions were interspersed with attractive entertainment features, which were voted a success by all present. It is planned to hold the 1931 convention in Winnipeg, Manitoba.

Officers elected were as follows:

President, Hugh McNair, Manager, Gas Utility, Winnipeg Electric Co., Winnipeg, Manitoba; Vice-President, Harry S. Williams, Superintendent, Gas Department, Board of Light & Heat Commissioners, Guelph, Ontario; Second Vice-President, D. G. Munroe, Vice-President and General Manager, Montreal Coke & Mfg. Co., Montreal, Que.; Secretary-Treasurer, George W. Allen, Industrial Survey Engineer, Toronto, Ontario.

Executive Committee—Arthur Hewitt, Vice-President and General Manager, Consumers' Gas Co., Toronto, Ont.; J. J. Humphreys, Chief Engineer, Gas Department, Montreal Light, Heat & Power Co., Montreal, Que.; J. S. Norris, Vice-President and Managing Director, Montreal Light, Heat & Power Co., Montreal, Que.; C. A. Jefferis, Superintendent, Gas Works, Consumers' Gas Co., Toronto, Ont.; A. T. Leavitt, President, Hamilton By-Product Coke Ovens Ltd., Hamilton, Ont.; J. M. H. Young, Superintendent, City Gas Company, London, Ont.; V. S. McIntyre, Manager, Public Utilities Commission, Kitchener, Ontario; Col. D. R. Street, General Manager, Ottawa Gas Company, Ottawa, Ont.

Managing Committee Representatives are the same as last year with exception of the late J. J. Armstrong who was succeeded by Edward J. Tucker of Toronto.

Changes in Personnel

(Continued from page 311)

recently by E. A. Olsen, executive vice-president.

Under the new organization plan the Oklahoma Natural territory will be divided into thirteen major districts with a district manager in charge of each district, who will be responsible to the central management.

Ardmore (includes Healdton, Ringling, Wilson): F. W. Bortle, district manager; J. Gillis, district superintendent.

Broken Arrow: C. E. Cantrell, district manager; J. E. Mineo, district superintendent.

Chandler (includes Arcadia, Daventport, Luther, Meeker, Stroud, Wellston, Prague): W. W. Bruce, district manager; H. S. Clark, chief clerk.

Claremore (includes Inola, Ramona): J. A. Breeden, district manager; J. E. Mineo, district superintendent.

Enid (includes Deer Creek, Hunter, Nardin, Pond Creek, Peckham, Lamont): C. R. Shiers, district manager.

Haskell (includes Bixby, Coweta, Porter): R. B. Caskey, district manager; R. Eidson, District superintendent.

Muskogee: W. M. Baker, district manager; R. Eidson, district superintendent.

Oklahoma City (includes Norman with Fay Kee local manager, Edmond with W. A. Mineo local manager, El Reno with J. W. Lockridge local manager, Bethany, Britton, Yukon): W. P. Canavan, vice-president; M. L. Kapp, district manager; P. V. Root, assistant district manager; T. A. Wood, district superintendent; C. E. Sherburne, assistant district superintendent.

Okmulgee (includes Checotah, Eufaula, Morris, Warner, Weleetka): W. M. Maher, district manager; R. Eidson, district superintendent.

Sapulpa (includes Depew, Kellyville, Shamrock): C. C. Master, district manager; J. E. Mineo, district superintendent.

Shawnee: F. E. Padden, district manager; F. M. Orelup, district superintendent.

Tulsa (includes Dawson, Garden City, Turley): W. H. Bagley, district manager; J. A. Ray, assistant district manager; J. E. Mineo, district superintendent.

Kansas: C. M. Van Slyke, district manager; John Bass, district superintendent.

Personal and Otherwise



W. P. Hutchinson

board. A. I. Ayre was named secretary and treasurer.

F. W. Holbrook, manager of the Mississippi Natural Gas Corp., has been promoted to manager of the Alabama Natural Gas Corp., Talladega, Ala.

Lyall G. Ireland has been elected vice-president of the New Orleans Public Service, Inc. For the past five years Mr. Ireland has been assistant to the vice-president.

W. G. Winters, vice-president and general manager of the Houston Gas and Fuel Company, has been transferred to the general office of the United Gas System. Mr. Winters will be succeeded by K. L. Simons, who has been serving as assistant general manager.

C. M. Carter, engineer for the Wichita Gas Company, Wichita, Kansas, has been transferred to the Hutchinson Gas Company, Hutchinson, Kansas. Mr. Carter's place is being filled by Charles F. Morris, formerly with the Public Service Company of Colorado.

R. J. Daugherty, director of public relations, Empire Gas and Fuel Company, has been appointed mayor of Bartlesville, Okla.

Edward P. Bailey, Jr., consultant in gas house heating and former president of the Bryant Heating and Manufacturing Company, has been made general manager of the newly-established gas heating division of the National Radiator Corporation.

Ray C. Finch has been appointed new business manager for the Northwest Cities Gas Company with headquarters at Walla Walla, Wash.

W. P. Hutchinson was elected president of the Sprague Meter Company, Bridgeport, Conn., at a recent annual meeting of the stockholders. Mr. Hutchinson was a vice-president of the company and succeeds H. H. Sprague, who was elected chairman of the board.

P. A. McLeod, formerly district manager of the Northern Indiana Power Company at Huntington, is now division manager at New Castle.

T. B. Wilson was elected president of Louisville Gas and Electric Company at a recent meeting of the board of directors. Mr. Wilson had been vice-president and general manager of Louisville Gas and Electric Company since 1924.

D. C. Shaffer, general manager of the Memphis Gas Company, affiliate of Appalachian Gas Corporation, has been elected vice-president of the company.

Everett Dennis has joined the North Central Gas Company personnel as assistant sales manager with headquarters in Scottsbluff, Nebraska.

L. R. King has been made president and general manager of the Iowa-Nebraska Light and Power Company, Maryville Electric Light and Power Company and the Lincoln Traction Company. Mr. King has headquarters in Lincoln, Nebraska.

W. B. Barber has been named successor to C. A. Gilkerson as supervisor of training and education in the Public Service Company of Northern Illinois.

Phillip M. Wentworth, for many years associated with Stone & Webster in the management of electric, gas and transportation properties, has been elected a vice-president of the Stone & Webster Service Corp., with headquarters in Boston.

Frank C. Holitzka has been appointed chief industrial engineer for the North Central Gas Company with headquarters in Scottsbluff, Neb.

George J. O'Neil, fuel engineer of the Pennsylvania Gas & Electric Company, York, Pa., was unanimously re-elected chairman of the York group of the American Society for Steel Treating.

George F. Baker, Jr., has been elected a trustee of the Consolidated Gas Company of New York to succeed his father, the late George F. Baker.

Fred Schnieder has been appointed district sales manager of the Suburban Gas Service Company, Fort Collins, Colo.

D. P. Hartson has been appointed operating manager of the Equitable Gas Company, Pittsburgh, Pa.

Harley G. Tanner has been appointed local manager of the North Central Gas Company at Gering, Neb.

John A. Weston, assistant to the vice-president of the Detroit-Michigan Stove Company, has retired after thirty-five years of service.

Jamie Tabor, for many years connected with the Rio Grande Valley Gas Company, in Brownsville, has taken active charge of the Pharr, Texas, office of the company.

E. W. Browne has been appointed district manager of the Northwest States Utilities Company, a subsidiary of the Minnesota Northern Power Company. Mr. Browne will locate in Sheridan, Wyo.

Marcy L. Speery has taken over the management of the Fall River Gas Works Company, Fall River, Mass., with the official title of vice-president.

Bert O. Wood of Fort Smith, Okla., has been made manager of the Seminole, Okla., Gas Company, succeeding A. D. English who was transferred.

H. Clifton Brooks, manager of the Pawtucket Gas Company, Pawtucket, R. I., and the Pawtucket division of the Blackstone Valley Gas and Electric Company, has resigned to assume charge of the gas department of Virginia Electric and Power Company.

H. F. Gibbs, graduate of the Johns Hopkins University of Baltimore, Maryland, and a student in the gas engineering course offered by Johns Hopkins, is making a combined business and pleasure trip to Europe. He attended the meetings of the German Association of Gas and Water Engineers, held June 8 to 10; and the First International Gas Conference and 68th Annual General Meeting of the Institution of Gas Engineers, London, held June 2 to 4. Mr. Gibbs is accompanied by Mrs. Gibbs and upon his return to this country will enter upon engineering duties with the Washington Gas Light Company, Washington, D. C.

John A. Waters

John A. Waters, sixty-four, superintendent of the gas department of the Stamford Gas and Electric Company, Stamford, Conn., died at his home in Nash Court, Glenbrook, on May 9, of a heart attack. He had been employed by the Stamford company for forty-two years.



L. G. Ireland



G. J. O'Neil

McCarter Medals Presented To Seven for Life-Saving

ONE of the features of the annual meeting of the Mid-West Gas Association, held at Dubuque, Iowa, last Spring, was the presentation of a McCarter Medal to Jonathan Ainsley, superintendent of gas distribution of the Peoples Light Company, Davenport, Iowa, by Alexander Forward, managing director of the American Gas Association.

Mr. Ainsley received this recognition as a result of his efforts in saving the life of a laborer who had been overcome by gas while at work in a trench. With the assistance of an unidentified Boy Scout, Mr. Ainsley applied the Shafer Prone Pressure Method of Resuscitation and was successful in reviving the victim.



Jonathan Ainsley

The McCarter Medal is presented by Thomas N. McCarter, President of the Public Service Electric & Gas Company, Newark, N. J., through the American Gas Association, to persons who resuscitate those overcome by gas asphyxiation by the Shafer Method.

More than two hundred persons were present at the presentation of the medal to Mr. Ainsley.

At a banquet of the Gas Meters Short Course, held at Iowa State College, Ames, Iowa, Walter Young, plant clerk of the Cedar Rapids Gas Company, received a McCarter Medal for having revived a boiler maker, who had been asphyxiated while at work on the waterless holder shell. The presentation was made by Arthur Huntington of the Iowa Railway and Light Corporation.



Walter Young

Last April, a McCarter Medal and certificate were presented to M. S. Davidson of the Green Bay Gas Department, Wisconsin Public Service Corporation, in recognition of his splendid work in the resuscitation of a woman who had been overcome by gas. The presentation was made by A. J. Goedjen, manager, at a meeting of the gas department employees.



M. S. Davidson

A. Gordon King, service engineer of the American Gas Association, presented a McCarter Medal to Edward A. Polhemus, fitter of the Jersey Central Power and Light Company, who resuscitated a supervisor of the Gas Department of the Jersey Central Power and Light Company, who had been asphyxiated while installing gauges in a manhole at Faithaven, N. J. The presentation was made at a meeting of Coast Division employees, held at Red Bank, N. J.



E. A. Polhemus

At a meeting of employees and guests at the offices of the Webster and Southbridge Gas and Electric Company, Webster, Mass., Thomas J. Germain, foreman of the New England Power Engineering and Service Corporation, was presented with a McCarter Medal for saving the life of Thomas Baumgarten, construction engineer of the Semet-Solvay En-



T. J. Germain

gineering Corporation, who was overcome with gas while in charge of the installation of generating equipment at the gas works in Webster. This presentation was made by M. B. Webster, president of the New England Gas Association.

Conrad N. Lauer, President of the Philadelphia Gas Works Company, presented a McCarter Medal to James Carpino, compressor operator, for saving the life of a citizen, who had been overcome by gas at his home. This presentation was made during a rally of more than 3,000 employees of the Philadelphia Company.



James Carpino

Officials, employees and their families of the Western United Gas and Electric Company, were present at Elgin, Illinois, at the presentation of a McCarter Medal to Ray F. Conway, a fitter, who revived a helper who was overcome while engaged in locating a gas leak.



Ray F. Conway

Home Service Scrap Books

THE Home Service Committee was able to exhibit at the 1930 American Gas Association Convention, 23 scrapbooks from Home Service Departments in 12 different states. The scrapbooks gave much information as to what departments were doing around the country. They included samples of advertising leaflets, programs of classes, announcements, pictures of departments and pictures of classes, telling the story of home service in those companies.

The Home Service Committee hopes to have even a larger display this year for the information of those visiting the Home Service booth. They may be ordered through the Home Service Counsellor at the American Gas Association Headquarters, 420 Lexington Avenue, New York, N. Y. The cost is \$3.75 which includes lettering and postage.

Home Service Activities

Home-Making Lectures Mark Brooklyn Branch Opening

AN attractive new building which will house its Flatbush branch office was opened by The Brooklyn Union Gas Company, Brooklyn, N. Y., on May 11. The Borough President of Brooklyn, Henry Hesterberg, officiated at the formal opening ceremonies, cutting a narrow silk ribbon held across the main entrance by President James H. Jourdan and Vice-President A. F. Staniford.

In celebrating the opening, the company arranged a series of lectures and demonstrations on subjects related to "The Art of Twentieth Century Home-Making." The programs, which were entertaining as well as educational, were held each afternoon and evening during the opening week, ending with an informal reception to the general public on Saturday afternoon and an entertainment and dance for employees on Saturday night. The series attracted more than 30,000 visitors to the new office during the first six days it was open.

The company's Home Service Division, of which Miss Ruth Soule is director, took considerable care in arranging the opening week program with a view to enlisting the interest of a majority of residents in the section. Well-known authorities on varied phases of home-making were engaged to deliver the lectures and give demonstrations.

Among the many subjects discussed were "The Effect of Early American Furniture on Modern Design," "Selecting Silks to Suit Your Personality," which was illustrated by a fashion show; "Lazy Day Laundering" and "Suggestions for Summer Hospitality." The final lecture, "Interior Decoration for the Home," was given by George A. Croker, a

noted authority on interior decoration.

The programs were held in the large auditorium which is a feature of the new building. It occupies the rear of the ground floor. The stage is so designed that when not in use for entertainments and demonstrations, it provides an ideal place for a model kitchen display. It is so constructed that a visitor gets the impression he is looking at a portion of an attractive bungalow, the walls of which have been removed to give a view of the kitchen.

The building is constructed of fancy tapestry brick and trimmed in white stone. Its architecture is modern American. It has a ninety-foot frontage on Duryea Place, near Flatbush Avenue, and is 110 feet deep. Two stories in height with daylight basement under the entire structure, it is one of the handsomest buildings in the Flatbush section of Brooklyn.

Beauty as well as utility was kept in mind in laying out the interior of the building. Richly colored, velvety rugs cover a portion on the main floor and the walls are hung with paintings and etchings. A replica of an early American fireplace lends a homey atmosphere to the room.

The cashiers will be located on the ground floor, behind a handsome bronze "open turret" type of cage, on either side of which is a large display floor for the showing of the latest appliances. In addition to the model kitchen, one other permanent display, a model laundry, will be maintained on this floor.

The clerical staff will be located on the second floor, a feature of which is an attractively furnished rest room for women employees. Another comfortable rest room has

been located in the basement for the use of women customers. The basement also provides another display floor for the larger appliances, including two gas-fired boilers which heat the building. Lockers and a rest room are provided in the basement for men employees.

All four of the men directly responsible for conducting the branch business are residents of Flatbush. They are T. B. J. Merkt, manager; P. S. Berry, office manager; Richard E. Gier, district sales manager, and Frank J. Brennan, chief clerk.

Oil and Gas in the Bluegrass

A TIMELY report has been made available by the Kentucky Geological Survey. It is Volume 40 of the Sixth Series of the Survey, entitled "Oil and Gas in the Bluegrass Region of Kentucky," by Willard Rouse Jilison, state geologist. The report is particularly important at this time due to the present development of the new gas field on Stephens Creek in eastern Carroll and western Gallatin counties.

The report contains ten chapters, illustrated with forty-seven figures which include a sketch map of the structure of the counties making up the Bluegrass. In addition there is found a short discussion of the stratigraphy, a record of drilled wells, geologic structure, and a statement on the possible producing sands of the area.

The Kentucky Survey, and particularly Dr. Jilison, has long advocated drilling for commercial gas production in the Bluegrass. This was in contradiction to the record of a number of wildcat wells drilled over a period of many years, none of which made commercial production. Geologists and operators in general, have also considered the area unfavorably, due to the geologic nature of the area. However, the bringing in of several gas wells in the Stephens Creek area, one being reported in excess of four million feet of gas, has shown that there are, without doubt, possibilities of commercial production in the Kentucky Bluegrass.

This report may be obtained from the Kentucky Geological Survey, Frankfort, for \$1.25 postpaid.

Manufacturers' Section

E. S. DICKEY, Chairman C. W. BERGHORN, Secretary DAVID F. KAHN, Vice-Chairman W. E. STEINWEDELL, Vice-Chairman

List of Exhibitors at Next Convention Continues to Grow

MORE than 200 exhibitors whose products will be on display at the Thirteenth Annual Convention of the American Gas Association, at Atlantic City, N. J., in October had been assigned space by the Exhibition Committee on June 10, and the number was mounting steadily. Indications are that this year's exhibit will be one of the largest and most complete yet staged by the Association.

Following is a list of exhibitors as of June 19:

Name	Booths
Allen Mfg. Co. Inc.	717
A-B Stove Co.	425
Adams Bros. Mfg. Co. Inc.	210
Addressograph Co.	616, 700
Air Reduction Sales Co.	206
Alpha-Lux Co. Inc.	228
Aluminate Co. Inc.	116
American Cast Iron Pipe Co.	109, 110
American Foundry & Furnace Co.	141
American Gas Furnace Co.	410
American Gas Journal	629
American Gas Products Corp.	527, 528
American Heater Corp.	513, 514
American Lava Corp.	732
American Meter Co.	323, 4, 5; 404, 5, 6
Griffin & Co., John J.	
Helme & McIlhenny	
Maryland Meter Works	
McDonald & Co., D.	
Metric Metal Works	
Pacific Meter Works	
Tufts Meter Works, Nathaniel	
American Radiator Co.	527, 28, 29, 30
American Rolling Mill Co.	220
American Stove Co.	522, 3, 4, 5, 6
Clark & Co. Div., Geo. M.	
Direct Action Stove Co. Div.	
New Process Stove Co. Div.	
Quick Meal Stove Co. Div.	
Reliable Stove Co. Div.	
American Thermometer Co.	136
Andes Range & Furnace Corp.	709
Arco Gas Appliance Corp.	529, 30
Associated Gas & Electric System	301
Autogas Corp.	147
Automatic Gas Steam Radiator Co.	140
Bailey Meter Co.	205
Barber Gas Burner Co.	311
Barber-Greene Co.	15
Bartlett Hayward Co.	604
Behringer Co., Edward A.	619
Bingham & Taylor Corp.	223
B-Line Boiler Co.	332

Name	Booths
Blodgett Co., G. S.	316
Bristol Co.	828
Brown Instrument Co.	100, 101
Bryant Heater & Mfg. Co.	430, 431
Burdett Mfg. Co.	811
Burroughs Adding Machine Co.	5, 6; 9, 10
Carrier-Lyle Corp.	626; 710
Central Foundry Co.	705
Chace Valve Co., W. M.	716
Chambers Mfg. Co.	240
Chaplin-Fulton Mfg. Co.	319
Chapman Valve Mfg. Co.	224
Chicago Bridge & Iron Works	226
Cleveland Co-Operative Stove Co.	612
Cleveland Heater Co.	308, 9, 10
Cleveland Trencher Co.	601, 602
Clow & Sons, James B.	213
Connelly Iron Sponge & Governor Co.	108
Continental Stove Co.	731
Crane Co. 720, 1, 2, 3, 4, 5; 801, 2, 3, 4, 5, 6	
Cribben & Sexton Co.	614, 615
Crown Stove Works	137
Cruse-Kemper Co.	829A
Cutler-Hammer, Inc.	503
Dearborn Chemical Co.	518
Detroit-Michigan Stove Co.	606, 7, 8, 9, 10
Dresser Mfg. Co., S. R.	401, 402
Dun-Rite Clock Device Co.	313
Economy Governor Co.	621
Electrolux Refrigerator Sales, Inc.	Stage
Elliott Addressing Machine Co.	800
Estate Stove Co.	428, 9; 511, 12
EverHot Heater Co.	707
Faraday Refrigerator Corp.	831, 2, 3
Felt & Tarrant	719
Fisher Governor Co. Inc.	701
Florence Stove Co.	809
Floyd-Wells Co.	807
Forrest City Foundries Co.	119
Foxboro Co. Inc.	703, 704
Fox Furnace Co.	531
Gas-Aire, Inc.	712
Gas & Electric Heater Co.	212
Gas Machinery Co.	306
Gas Purifying Materials Co.	620
General Ceramics Co.	118
General Coal Co.	103
General Gas Light Co.	726, 7, 8, 9
Giant Mfg. Co.	204
Gifford-Wood Co.	202
Glenwood Range Co.	633, 34
Globe American Corp.	231

Name	Booths
Gray & Dudley Co.	613
Griswold Co., W. A.	328
Groble Gas Regulator Co.	420
Guardian Gas Appliance Co.	211
Gwathmey Mfg. Co.	217
Handley Brown Heater Co.	120
Harper-Wyman Mfg. Co.	631
Heating & Ventilating	142
Hoffman Heater Co.	317, 318
Homestead Heater Co.	111
Hones Co. Inc., Chas. A.	715
Hotstream Heater Co.	230
Hubbard Oven Co.	834
Improved Equipment-Russell Engineering Corp.	200
Inertol Co.	203
International Business Machines Corp. 1-B	
Isbell-Porter Co.	829B
Jackson Engineering Corp.	107
Johns-Manville, Inc.	836, 837
Judelson Dryer Corp.	239
Kelly, Inc., John G.	314
Kernit Incinerator Co.	312
Kitson Co.	838
Kompak Co.	327
Koppers Construction Co.	605
Lambert Meter Co.	322
Lattimer Stevens Co.	222
Lavino & Co., E. J.	519
Lawson Mfg. Co.	219
Linde Air Products Co.	133
Littleford Bros.	419
Lovekin Water Heater Co.	623, 624
Majestic Mfg. Co.	117
McWane Cast Iron Pipe Co.	225
Mears-Kane-Ofeldt, Inc.	416
Merco Nordstrom Valve Co.	830
Mettler Co., Lee B.	221
Milwaukee Gas Specialty Co.	427
Mine Safety Appliances Co.	207
Minneapolis-Honeywell Regulator Co.	413, 414
Mitchell Specialty Co.	236
Mohawk Asphalt Heater Co.	706
Moore Brothers Co.	627
Mueller Co.	320
Mueller Furnace Co., L. J.	326
Mulcare Engineering Co.	622
National Tube Co.	302, 3, 4
Natural Gas Magazine	628
Ohio Foundry & Mfg. Co.	214

Name	Booths
Partlow Corp.	718
Patrol Valve Co.	232
Peerless Heater Co.	711
Peerless Mfg. Co.	233
Pennsylvania Furnace & Iron Co.	415
Perco-Steril Machine Corp.	238
Permutit Co.	201
Petroleum Heat & Power Co.	632
Philfuels Co.	16, 17
Pittsburgh Coal Co.	517
Pittsburgh-Des Moines Steel Co.	618
Pittsburgh Equitable Meter Co.	227, 305
Pittsburgh Incinerator Co.	810
Pittsburg Water Heater Co.	508, 9, 10
Public Utilities Reports, Inc.	132
Ray-Glo Corp.	714
Remington Rand, Inc. 2, 3, 4; 11, 12, 13	
Republic Flow Meters Co.	106
Republic Steel Co.	113, 14, 15
Reynolds Gas Regulator Co.	417, 418
Robbins Publishing Co.	500
Roberts & Mander Stove Co.	331, 412
Roberts Brass Mfg. Co.	611
Roberts-Gordon Appliance Corp.	229
Robertshaw Thermostat Co.	234, 235
Roots-Connersville-Wilbraham, Div.	505
Roper Corp., Geo. D.	432, 515

Name	Booths
Rudy Furnace Co.	625
Ruud Manufacturing Co.	407, 8, 9
Ryan, Scully & Co.	736
Safety Gas Lighter Co.	139
Safety Gas Main Stopper Co.	135
Sands Mfg. Co.	426
Savory, Inc.	737
Selas Co.	730
Semet-Solvay Engineering Corp.	321
Sheer Co., H. M.	733
Simplex Gas Products Co.	708
Skinner Co., M. B.	129
Slattery & Bro. Inc., J. B.	237
Smith Corp., A. O.	520, 521
Smith Mfg. Co., A. P.	126
Somerville Stove Works.	121
Spencer Thermostat Co.	215, 216
Sprague Meter Co.	502
Stacey Bros. Gas Construction Co.	504
Stacey Mfg. Co.	400
Standard Gas Equipment Corp.	423, 4; 506, 7
Stat-Amatic Instrument & Appliance Co.	735
Superior Meter Co.	300
Surface Combustion Co.	333, 34, 35

Name	Booths
Tappan Stove Co.	329, 330
Therminul Corp.	122
Underwood Elliott Fisher Co.	516, 600
United Engineers & Constructors, Inc.	421, 422
United States Bureau of Mines.	104, 105
United States Pipe & Foundry Co.	501
Universal Sand Equipment Co.	208, 209
Victaulic Co. of America.	617
Wailes Dove-Hermiston Corp.	14
Walker & Pratt Mfg. Co.	411
Watts Regulator Co.	315
Welsbach Co.	112
Western Gas Construction Co.	603
Western Steel Products Corp.	713
West Gas Improvement Co.	702
Wilcolator Co.	307
Williams Radiator Co.	808
Wood & Co., R. D.	403
Wood Mfg. Co., John.	817, 818
Youngstown Pressed Steel Co.	630
Youngstown Sheet & Tube Co.	134

Application for Medal Must Be Received by August 15



Meritorious Service Medal and Gold Button

APPPLICATIONS in the contest for the annual award of the American Gas Association Meritorious Service Medal must be received at Association headquarters, 420 Lexington Avenue, New York, N. Y., on or before August 15, 1931, it is announced by Alexander Forward, Managing Director of the Association.

This award, which consists of a gold medal, button and certificate, is presented each year at the annual convention of the American Gas Association to the individual designated as having performed the most meritorious act in the gas industry for the year beginning July 1 and ending June 30. This year's award will be

made during the convention, which will be held at Atlantic City, N. J., October 12-16. Application forms will be provided upon request to Mr. Forward.

Award of the Meritorious Service Medal, which is one of the most coveted honors in the gas industry, was made possible through the generosity of the late Walter R. Addicks, formerly senior vice-president of the Consolidated Gas Company of New York, and it is available to employees of all manufactured and natural gas companies and manufacturer company members of the Association.

Last year, the award was made to J. L. Conover, auditor, gas department of the Public Service Electric & Gas Company, Newark, N. J.

Classes For Domestic

JUST lately a project was proposed that home service departments in the gas industry spread their scope of influence and give classes to maids or domestics in their localities. This activity is already under way in a good number of companies and could list several departments.

In the October, 1930, issue of the A. G. A. MONTHLY was printed a picture of a class of colored maids who had received instruction from the home service department of the Louisiana Public Utilities Company at Lafayette, Louisiana, under the direction of Mrs. Myril Richard.

Testing Laboratory

R. M. CONNER, Director

MANAGING COMMITTEE

J. S. DeHART, Jr., Chairman

N. T. SELLMAN, Secretary

Revised A. G. A. Approval Certificate Renewable for Ten Years

BEGINNING next year, a new form of approval certification will be issued on all appliances approved by the American Gas Association Testing Laboratory. The new certificate, which is quite different from the one now in use, was approved by the Laboratory Managing Committee at its last meeting. The detailed description of the appliance or appliances covered will be given on the back of the new certificate with only the formal matter, a brief statement of conditions governing the approval, the name and address of the manufacturer, and the name and number of the appliance approved, appearing on its face. Space is also provided on the face of the certificate whereby it may be renewed from year to year by endorsement of a Laboratory Inspector.

This procedure is designed to reduce the inspection expense to manufacturers since it will not be necessary to re-issue an approval certificate except in those cases where some constructional change in the appliance has been made. This will also avoid delay necessitated by the re-issuing of all certificates each year, since the new certification will be renewed by the inspector at the time the factory inspection is made. The revised form provides more space for a description of the appliance and it is intended to make such description in much more detail than that which is given on the present approval certificate.

The use of the new certificate naturally will result in a change of inspection fees which have been approved and will go into effect in 1932.

A reproduction of the new certificate and the new inspection fees will be shown in the revised edition of the booklet on Laboratory Testing Policies which will be published later in the year.

New "Application for Test" Form Issued

IT is anticipated that a considerable amount of time and inconvenience will be saved manufacturers submitting appliances to the Laboratory for approval by the new "Application for Test" form recently approved by the Laboratory Managing Committee. The new form is more complete than the one formerly used and is so written that it covers all appliances or appurtenances which a manufacturer may submit, and is effective for a full year from the time of execu-

tion. In the future all manufacturers wishing to submit equipment for approval will use the new application. It will be issued in duplicate, the manufacturer retaining one copy while the other will be forwarded to the Testing Laboratory.

This change will not only save the manufacturer considerable time and inconvenience but will relieve the Laboratory of much routine work which was necessary in handling applications on each individual appliance submitted.

The new form reduces to writing many provisions which, although in effect, were not contained in the former applications, and which should result in a better understanding of the Laboratory's policies relating to approvals.

In case any manufacturer has not received copies of the new application they may be secured upon request from the Director, American Gas Association Testing Laboratory, Cleveland, Ohio.

Activities of A. G. A. Approval Requirements Committees

THE preliminary draft of A. G. A. Approval Requirements for both hotel and restaurant ranges and for garage heaters were completed by the respective Subcommittees last April in record time considering the amount of research involved in their preparation. This was especially true with respect to hotel and restaurant ranges, since they were so entirely different from other appliances for which requirements had been previously prepared. An interesting feature of the specifications for hotel and restaurant ranges lies in the fact that the Subcommittee eliminated to a much greater extent than previously, requirements directly pertaining to construction, and specified instead, performance tests for the determination of rigidity and durability. This is in line with the general trend of the requirements for all types of appliances. Where practical, unquestionably this is the most logical course, since it insures that approved appliances will have the required degree of rigidity and durability without placing unnecessary restrictions on ingenuity in design and construction.

Extensive research is being conducted by the Testing Laboratory on industrial gas boilers in conjunction with the preparation of approval requirements for appliances of this type. This set of requirements is of special interest in that it represents the entry of the Laboratory into the industrial field. The next meeting of the Industrial Gas Boiler Sub-

committee will probably be held late in June.

A Subcommittee on A. G. A. Approval Requirements for mechanical refrigerators has been completed and it is expected that the committee will proceed with the drafting of approval specifications for refrigerators within the near future.

The newly organized Subcommittee to decide on Association policies concerning appliance accessories headed by H. L. Whitelaw, held its first meeting during the week of the Natural Gas Convention in Memphis, Tenn. A recognized need for some form of requirements for accessories has existed for some time. It has also been recognized that A. G. A. approval cannot be given to accessories in the sense that it is granted on complete units for the reason that their safe and satisfactory performance depends in a large measure upon the appliance to which they are attached as well as upon their method of attachment. It is, however, generally felt that such equipment can be tested by the Laboratory and listed as satisfactory if it complies in all respects with the A. G. A. requirements. Listing of accessories should be of considerable assistance to manufacturers in merchandising their products. It should also react in a decreased cost of production and an ultimate benefit to the consumer both from the standpoint of economy and satisfactory performance.

A. G. A. Laboratory Among Exhibitors

THE American Gas Association Testing Laboratory was among the exhibitors at the annual convention of the American Home Economics Association, held in Detroit, June 22 to 26. This association has a membership of home economics teachers, government extension workers, household editors of women's magazines and home economics women in business.

Building 74-Mile Line

A SEVENTY-FOUR mile gas pipe line is being constructed by the Panhandle Power & Light Company from Dumas, Texas to Boise City, Okla., to supply natural gas to the Cimarron Utilities Company, one of its subsidiaries, which holds the gas distribution franchise at Boise City. It expects to be using natural gas from this line by September 1. The company will construct a six-inch line to Stratford and a five-inch main from that point to Boise City.

Industrial Gas Section

D. W. CHAPMAN, Chairman

C. W. BERGHORN, Secretary

A. J. PETERS, Vice-Chairman

Selling a Premium Fuel to Industry*

By A. J. PETERS,

Vice-Chairman, Industrial Gas Section,
American Gas Association

HAVE you ever before heard any fuel referred to as "a premium fuel"? I haven't—and yet the more you analyze that phrase and visualize all that it implies the more impressed you become with its aptness when applied to gas. The word "premium" is from the Latin "præmium" and means—what one has got before, or better than, others. It implies, from the seller's standpoint, that the product is better and that it has special characteristics not possessed by other things in the same class. Measured by these standards gas is truly "a premium fuel." From the purchaser's standpoint, it implies that he has been made to see these superiorities and is willing to pay a consideration for the extra advantages.

The more you think of this happy choice of the word "premium" as applied to gas the more avenues of thought are awakened and one that keeps recurring in my mind over and over again has to do with the association of the use of the word in connection with insurance. Which suggests to me that the use of gas is a form of insurance. It is submitted to you that in these days of almost universal acceptance of the necessity for insurance of all kinds it might be of considerable assistance to us to stress this phase of our service. The use of gas, in industry particularly, is insurance because its supply is reliable—there is no likelihood of variation in quantity or quality. It is insurance because it is a fuel free from substances that might spoil or contaminate the product. It is insurance because it is a fuel that permits of dependable automatic temperature control, eliminating spoilage due to temperature variations.

We could go on listing and discussing in detail the various advantages of gas and indicate how each constituted a special form of insurance that adds to the peace of mind of the manufacturer. The selling of this premium product of ours requires:

- First—Familiarity with all possible points which can be listed as special advantages.
- Second—Selecting from these points those which apply specifically to the particular prospect being considered.
- Third—Presenting these findings in such a way as to direct the prospective buyer's thoughts along the proper lines toward the selection of "the premium fuel" as the only logical conclusion.

* Digest of address before Southern Gas Association, Chattanooga, Tenn., June 10, 1931.

Who is best qualified to collect the facts and what is the best way to present our sales appeal to the manufacturers are probably the most important phases of this question of selling a premium fuel to industry. Because it is necessary to be or become familiar with various methods of production, but perhaps more because our contacts are usually with engineers the tendency in most gas companies is for the industrial gas representatives to be technically trained. Considerable has been said and written about the lack of sales ability among engineers, but I for one have come to the conclusion that in these times in the cases of the sale of an article, product or service like ours the presentation of hard, concrete, irrefutable facts carry considerable more weight than the usual sales talk of the average ordinary salesman. In other words, I do believe that in the past it was possible to accomplish a fairly acceptable job with regular salesmen rather than with engineer-salesmen, but today Mr. Production Manager has to be shown—and you have to talk to him in his language which is usually an engineer's. Aside from all this, if the individual is the least bit inclined, there is no reason to suppose that a good engineer cannot acquire sales ability. It is being done and the first requisite is enthusiasm and faith in the product he is selling. Emerson once said that nothing great is ever achieved without enthusiasm and it is axiomatic of any sales effort that the efficiency of the salesman is directly proportional to his enthusiasm for and faith in the worth of the product he is selling.

Ability to dig in and unearth apparently hidden facts and factors; aptitude for evaluating so-called intangibles and resourcefulness in meeting new and changing conditions are all part of the engineer's education and constitute fundamentals for the background and training of the industrial gas representatives. Of course it goes without saying that all of the data collected for a given prospect should be "sales slanted" in its presentation and I commend to you, if you have not already done so, the study of the American Gas Association's course in Industrial Gas Salesmanship as the best immediate means of acquiring a fund of information in intensive form.

The establishment of rates designed to attract volume business from a class of customers whose chief concern is the cost

of producing the article he is manufacturing is no easy task, but it is encouraging to us as sales representatives to see the increasing number of scientifically constructed rate schedules in the gas industry. There is more and more of a tendency to make rates in the light of competitive conditions and to depend upon the worth of our product, plus our sales ability to justify the existence of such rates. It therefore becomes the duty of those who are more closely in contact with the actual conditions to keep our executives informed of the situations and to use all of the energy at our command to see that our forms of rates keep pace with the changes. Market analysis and surveys should also be periodically conducted and studies of the various factors that mitigate against us securing certain business should be analyzed and presented to our executives for their guidance.

The question of compensation for industrial gas representatives is always an interesting one to a group of this kind and is sure to develop many differences of opinion. Certain it is that it has a decided bearing on the efficiency and worth of the man. Experience has taught many of us that because of the fact that this effort is so highly promotional in character as differentiated from ordinary merchandising activities that the compensation should be straight salary plus, perhaps, some sort of an incentive bonus. Needless to say the salary should be commensurate with the ability and education you expect such a representative to possess.

The gas industry is to be congratulated on the type and character of men in it who are willing to devote so much of their time to association matters, particularly in serving on the various committees, and apropos of this, I know of no committee that has done a better job than the Advertising Committee of the Industrial Section of the American Gas Association. The type of advertisements the industry is getting from this group of men is comparable to that of many well-known national advertisers, but we locally should not be satisfied with that alone. The use of gas for industries should secure its share of display space in our offices, stores and in the establishments of cooperating agencies. By this I do not mean the showing of drab, uninteresting looking equipment but a picturization or visualization of the results from the use of gas. Some mighty interesting window and store displays of industrial gas have been shown recently and more

of them are needed. Billboards constitute another form of especially effective advertising for the presenting of gas for industrial uses. Participation in engineering and industry shows and conventions are extremely valuable contacts and serve to remind our customers and competitors that the gas industry intends to secure its rightful share of the nation's fuel business.

Active cooperation with chambers of commerce, particularly in those activities centering around the attracting of industries to your community, is vital and too little of it has been done in the past.

All of this is but a sketchy idea of what there is back of this problem of selling gas to industries but of more importance than anything that has been said is what to do after the customer has been sold. We must not lose sight of the fact that our obligation, not only to the customer but to ourselves, our stockholders and to the industry has only just started when the customer has his appliances attached to our lines of mains.

The service behind the cock or valve on the appliance is the thing that counts and it is actually the thing for which the customer is paying. From the very beginning of the taking of an order for service down to the installation of the meter and the appliances, the reading of the meter, the credit procedure, the rendering of the bills and the collecting of the money due—every last single one of these items has a distinct and unmistakable bearing on the whole question of sales. Let us not forget the importance of these elements because we are selling something the customer cannot handle—cannot weigh or measure—cannot see and must therefore be placed in a unique class of its own.

Of paramount importance is the service and maintenance work we do on industrial equipment. There is urgent need for intelligent and courageous servicing of industrial gas appliances. I say courageous because there are times when it is good sound business economics for us to recommend and make changes on these appliances that mean an actual cut in revenue to us but they keep the business from ultimately going to competitive fuels. We need specialization in the servicing of these appliances because of the ever changing and improving automatic character of many of them and nothing can upset the plans of a sales organization quicker than inefficient servicing after the equipment has been installed. The harmful results to the opportunities for future sales from this phase of our activities is immeasurable. In these days of so many new automatic features on all classes of appliances the need for experts is imperative and we should be satisfied with nothing less.

The representative originally securing a customer should continue his contacts periodically and should be ever alert for signs of dissatisfaction or evidence of competitive fuels being considered. No one else should ever handle this cus-

tomers high bill complaints and the customer should be impressed with the fact that the gas representative is ever willing to be his expert advisor on all fuel matters.

I spoke awhile ago of the necessity for a sales representative possessing enthusiasm and faith in the worth of the product he is selling. That an industrial gas representative has many reasons to have such qualities is indicated in many ways. For instance, the extremely valuable work of research carried on by the industry—both by manufacturers and utilities. N. T. Sellman, director of sales and utilization of the Consolidated Gas Company of New York and a member of the Industrial Research Committee of the American Gas Association, recently presented a paper on some of these accomplishments and at least one of them was of sufficient interest to be given considerable prominence in the daily press.

The item of particular interest to us in Mr. Sellman's paper was the one referring to a gas-air ignition system for burning bituminous coal in order to accomplish increased efficiency and capacity without the production of smoke. In speaking of some of the disadvantages of using coal stokers Mr. Sellman mentioned that the saving in fuel due to these installations was materially reduced by the cost of the power required for forced draft and more than that the starting and light load operations are accompanied by objectionable smoke. Mr. Sellman says "to overcome the latter objections, gas-air jet ignition is under development to burn the smoke."

"The smoke making elements of soft coal amount to from 16 to 40 per cent of the total fuel value of the coal, and if wasted as smoke and soot represents that much coal wasted. Burning these volatiles by gas-air jets pays for the gas and electric power used, and leaves an ample saving to be passed on to the customer to interest him in the installation of the necessary equipment.

"The success of the principle has been demonstrated by research on a 90-horsepower horizontal tubular hand-fired boiler with 36 per cent volatile bituminous coal. With a perfectly cold boiler setting and water in the boiler at 55° F. fires were kindled with wood and smoky soft coal, and the boiler brought up to steam pressure repeatedly without objectionable smoke.

"Because of the relatively continuous feeding of coal in stoker-fired boilers, the capacity of gas-air jets required is only $\frac{1}{4}$ to $\frac{1}{2}$ as great as for an equivalent capacity of hand-fired boilers where a relatively large amount of fuel is fired at one time; therefore, the gas demand will be less and the load factor higher on stoker-fired boilers than with hand fired.

"In changing from hand firing to stoker firing with gas-air jets, the efficiency of steam generation is so increased that a better presentation can be made for gas due to greater fuel and labor saving.

"At this writing it appears that there is a market for from 750 to 1000 cu.ft. of gas for every ton of coal burned in steam boilers.

"The potential market is so great that gas companies are warranted in looking forward to the development of this new use for gas as a major outlet of excellent yearly load factor. The net savings to customers in the cases investigated so far, vary from 15 to 40 per cent."

Another development of interest to us is the Research Committee's contribution on the practical development of the new phenomenon known as "diffusion flame combustion." Mr. Sellman said:

"Although this phenomenon was known to exist, its practical application under controlled conditions had never been successful. Recent developments represent marked progress, particularly in connection with forging. The Research Committee realized that there are, undoubtedly, many other possibilities where "diffusion flame combustion" can be applied to high temperature applications; open hearth steel furnaces, glass melting, lime burning, etc., representing only a few of the other applications where this method of burning gas should result in improved economies.

"Diffusion flame is a term applied by Burke and Schumann to those gas flames in which the air for combustion reaches the gas by diffusion through the burning flame rather than by any form of premixing; that is, the air and gas unite and combustion takes place progressively as the air meets unburned gas.

"The Committee on Industrial Gas Research believes that when diffusion flame combustion is developed to its full possibilities, industrial gas men will have a new tool by which they can compete with other fuels in a way heretofore impossible. The combustion of oil has inherently some of the characteristics of diffusion flame combustion, and in many instances because of this fact, industrial gas men have been forced to use more B.t.u.'s from gas in a given operation than it has been necessary to use with oil. Likewise, it has been difficult in some instances to meet the competition of the radiant heat given off by electric heating devices, and it is expected that diffusion flame combustion will prove quite useful in enabling industrial gas men to round out a complete heating service to large factories on an economical basis."

I have taken the liberty of quoting so freely from Mr. Sellman's paper because it is apparent that we are on the threshold of the development of new business of appreciable magnitude. Further quotations from his paper might include the telling about the installation for practical test purposes of gas equipment for house cooling in three sections of the country this summer—one in New York, one in Chicago and one in Dallas, but I believe you all are familiar with the status of this activity to date. It is sufficient to say that because of this being a dehumid-

fication process rather than one actually cooling the air the results should be much more healthful than through present methods. This application of gas should make extremely attractive additions to our load.

Aside from all this to keep up the enthusiasm of the organization is the record of the sale of gas for industrial purposes in the last few years. I am indebted to the Statistical Department of the American Gas Association for the information that the sale of gas for industrial and commercial purposes by the manufactured gas companies of this country has risen from 70,380,000,000 cu.ft. in 1919 to 163,100,000,000 cu.ft. in 1929. And from the Bureau of Mines we learn that industries used 375,000,000,000 cu.ft. of natural gas in 1929 as compared with 249,000,000,000 cu.ft. in 1919. This is certain evidence that we are identified with an industry that is alive and virile and one that in its particular sphere of endeavor must be giving the best that money can buy.

As we look at these figures and try to picture what so much gas means, what it was used for and how it was sold, we cannot help but be impressed with the importance of our position in the economic structure of the country and with our contributions to the advancement of civilization. I leave it to you whether or not we are selling the premium fuel.

"Make or Buy Power" Question Again

OPPORTUNITIES for additional industrial gas sales arise anew every summer when fairly large industrial plants are confronted with the problem of running their entire boiler equipment for the purpose of supplying steam for some process requirements and furnishing motive power for the engines driving the generators, but at the same time having little or no use for the exhaust steam. Engines are therefore driven non-condensing, and boilers are operated at partial load. The result of this combination is a high cost of electric power and a high cost of steam for process requirements.

Industrial gas boilers set close to the job and furnishing high-pressure steam just as required and at high efficiency may be a more economical way of meeting the process load. Power can frequently be purchased at advantageous rates from the local utility company.

This makes it possible to dispense with the entire boiler room force for the summer months. It is particularly true in times like these, when business conditions are not the best, that economies of this nature will appeal to the manufacturer.

A recent survey of the territory of a large Eastern utility revealed several such possibilities, one in connection with a sulphur melting installation. The latter disclosed the need for readily available information on the physical properties of sulphur. Although the new A. G. A.

book "Combustion" is only in the course of preparation, reference to the manuscript material provided the necessary data. Since it is possible that a similar need exists elsewhere, the principal data is given here.

Some Physical Properties of Sulphur

THE common form of sulphur is the yellow solid, which crystallizes in the rhombic system. Sulphur in this form is practically insoluble in water, but is quite soluble in carbon bisulfide (41 lbs. in 100 lbs. of CS₂ at room temperature).

This stable form of sulphur, on heating to 205° F., slowly changes to a different crystalline form—monoclinic sulphur—and in this process 5.06 B.t.u. are absorbed per pound.

The melting points of rhombic and monoclinic sulphur are close together, one being at 235° and the other at 247°.

The specific heat of the solid sulphur is in the neighborhood of .20, and the liquid sulphur .234.

Above 320° F. the pale yellow liquid sulphur suddenly becomes dark brown and very viscous. This is due to another allotropic change, and this form is known as plastic sulphur.

Sulphur boils at 831° F.

N. F. P. A. Rules for Storage of Liquefied Petroleum Gases

AT a meeting in Toronto May 14, the Committee on Gases of the National Fire Protection Association submitted an excellent report on suggested rules for the proper handling of liquefied petroleum gases, as a portion of their Report on Gases. This is now available in printed form from the headquarters of the National Fire Protection Association, 60 Batterymarch Street, Boston.

The report contains a great deal of in-

formation of interest to every industrial gas man, particularly where problems of butane are involved. It covers such details as the construction and location of butane storage tanks, safety valves, discharge lines from regulators, filling densities, etc.

Activity of Utilization Data Committee

THE Utilization Data Committee has been very active all year in collecting new data on the best industrial gas installations in order to put into the hands of industrial gas men valuable information which will help them secure much new business. This work is a continuation of the work of a number of years. A typical sample of what the Committee is doing, is given in the Data Sheet below.

Each year many new plants are surveyed, and the data is collected. If it represents an improvement in operating results over previous data, it is included in the annual report of the committee. Otherwise, it is filed with Association Headquarters, and used for reference purposes. Of course, new installations or new processes are usually included.

The Chairman of the Utilization Data Committee, R. L. Manier, would welcome receiving from industrial gas engineers details of any plants in their territory which they think worthy of inclusion in the report. Blank data sheets are available on application to A. G. A. Headquarters.

Printed sets of the Data Sheets for previous years can also be secured from Headquarters at the nominal price of \$1 per set, consisting of some fifty installations, described on large sheets with big printing for easy reading. The sheets are thus valuable to use in connection with selling talks, because they can be held in the hand by the salesman and still be readable by the prospective customer.

INDUSTRIAL GAS UTILIZATION OPERATING DATA

AMERICAN GAS ASSOCIATION

420 Lexington Avenue, New York City

Subject Two Tilting Open Hearth Slag Melting Furnaces.

Industry Wrought Iron, new quantity production process.

Gas Equipment Used Home-made pipe burner and low-pressure regulator.

Description Pipe inserted in side walls of combustion chambers.

Working Space 31 ft. long; 12 ft. wide; 22 in. high.

Method of Handling Material Open Hearth electric charging machine and steel ladle on crane.

Method of Waste Heat Salvage Used Refractory regenerator checkers.

Gas Burning System Natural Gas, luminous flame, reducing atmosphere.

Operating Gas Pressure 3 lbs. per sq. in.

Refractories (thickness and kind) Fire and Silica brick, 13½" to 27" thick.

Insulation (thickness and kind) 3" to 4½" Sil-O-Cel and C-3 concrete.

Method of Venting Air-tight Ports, Slag Pockets and Flues.

Type of Temperature Control Hand control.

Working Temperature 2300° F. to 2400° F.

Burner Capacity in Cubic Feet Per Hour 67,000 cu.ft.

B.t.u. of Gas Per Cubic Foot 1000.

Time to Reach Working Temperature of 2350° F. (empty furnace) 3 hours.

B.t.u. required for Radiation Loss only at 2350° F. 12,000,000 to 14,000,000.

B.t.u. per Gross lb. when Producing at 10,000 lbs. per hour 3200.

B.t.u. per Net lb. when Producing at 10,000 net lbs. per hour 3200.

Time Temperature Cycle 15 min. reversals.

Brief Description of Process A charge of 75,000 lbs. to 90,000 lbs. of material to make a slag of

80% to 85% iron oxide and 10% to 15% silica is melted. This is drawn off in 15,000 lb. to 20,000 lb. lots. There is no loss in the operation and no chemical change except to raise the ferro oxide contents of the material is held in the furnace in a molten condition.

User's Opinion of Gas Equipment Has worked fairly satisfactory but steps are being taken for improvement.

Commercial Section

E. R. ACKER, Chairman

J. W. WEST, Jr., Secretary

SAMUEL INSULL, Jr., Vice-Chairman

The Sales Department As a Factor in Good Public Relations*

By ERNEST R. ACKER,

Chairman, Managing Committee,
Commercial Section

THE character of our public relations depends entirely upon the extent to which we are able to give our customers what they want for what they pay us. You will recognize that this thought has been previously expressed in numberless ways and on countless occasions. It is so obvious that it is almost irritating—irritating because while we will agree that it is sound in principle, it is so general that it is of little practical value. It immediately raises the highly controversial question—What does the customer want? And then, if that is possible of determination, can we give it to him at the price he will pay us for it? Each of us would probably answer these questions differently—in my own opinion he wants three things in particular:

First—He wants service established without unnecessary irritations and without delay.

Second—He wants a competent man quickly in case of trouble.

Third—He wants his bill at the end of the month to be reasonable.

These are the essential things that he wants. With them there are many others which he wants as a matter of course—courtesy, fairness, dependability, and all of the things which he expects from every business organization with which he deals.

The relative importance of the three essentials which I have outlined is debatable. They deal with two factors, the service which we render and the price of our product. I think it is fair to say that in our industry the customer will always expect the same service, no matter what the price of the product. He would not expect to get different treatment or less dependable service from one company than from another because the price was lower. He wants above all things, at all times—service. It is essential, therefore, that the public utility find the way to render such service and to collect the cost from the customer in the price charged for the product, or in a separate charge for appliance servicing.

I am not going to discuss all of the factors in the operation of a public utility which affect public relations. If I should attempt to do so it would be necessary to discuss practically every detailed operation which we carry on. Aside

from this, individual companies and committees of our national association have made splendid contributions on the subject in recent years, and the whole industry is alive to the importance of public relations in the development of our business. I feel, however, that there is something further to be said for the Sales Department as a public relations factor.

The effectiveness of the Sales Department as a public relations factor depends first upon our conception of the function of this important department of our business. It can be considered as merely a selling organization whose job it is to sell gas service or merchandise aggressively, from the standpoint of the benefit of such sales to the company; or, it can be considered as a service organization to the customer, rendering a consulting, purchasing service operated on the assumption that the company should only sell such service to the customer as he can use profitably. If you will agree with me that the latter conception is the sounder of the two, you will also agree that the Sales Department can have a very material part in the establishment of good public relations, because through the Sales Department a real service can be rendered. There is a great difference between pushing merchandise out by aggressive selling methods, as practiced by many merchandising organizations, and assisting the customer to purchase something which will be of service to him. Aggressive, competitive merchandising does not represent a valuable service to the customer, which will result in good public relations.

On the other hand, the furnishing of consulting service to our customers, which results in their making a profitable use of our service, represents a real service which has a direct effect on our public relations. If you will accept this conception as the platform of the Sales Department, we can proceed to the consideration of the organization of the department for such an operation, the adoption of plans for the guidance of the organization, and the training of the personnel for their jobs.

A first principle in the establishment of an organization for good public relations is that all customer contacts should be

under the control of one department. It is logical that this department should be the Sales Department, inasmuch as all customer contacts very directly affect the company's opportunity for selling additional service to the customer. It is of particular importance that the same department of the organization be responsible for the receipt of customers' requests for service, and the execution of such requests. It is still not unusual in the gas industry to find the customer contact function placed in the Commercial Department, and the Service Department, which takes care of the needs of the customer, in the Operating Department. In my opinion it is essential to the continuance of good public relations that the department which makes the commitment be responsible for its execution.

Inasmuch as we are discussing the subject of public relations, which is common to both the gas and electric business, I would like to refer specifically, for the remainder of this discussion, to my own organization, which is the Commercial Department of a combination gas and electric property. The plan of organization of the company is based upon the broad assumption that it should represent the best organization for an adequate and attractive service to the customer. The organization plan follows the usual division of the work of the company into three departments—Commercial, Operating and Accounting. We have centered in the Commercial Department, however, functions which in many other companies are found in either of the other two departments just mentioned, or in separate departments. The Commercial Department is responsible for public relations, sales, all customer contacts, publicity and advertising, and rates. We operate on the district manager plan, with each district manager responsible for all the company's operations in his district, with the exception of gas and electric generation or transmission. The Operating Department maintains centralized construction and engineering departments and keeps in the field operating engineers who advise the district managers on operating matters where necessary. We have left with the district manager all of the functions which it is necessary for him to control directly in order to render immediate service to the customer. The district managers are directly responsible to the Commercial Manager of the company. The Commer-

* Address presented before Metropolitan Gas Regional Sales Conference, Lake Mohonk, N. Y., May 21, 1931. Mr. Acker is General Commercial Manager of the Central Hudson Gas & Electric Corporation.

cial Manager, therefore, has the full responsibility for all of the functions of the company's business which directly affect its public relations, and is in a position to control the activities of all of the personnel which maintains the customer contact. It has been found that such co-ordination of the sales, customer contact, and rate functions has greatly facilitated the treatment of new business problems and has in many instances eliminated the possibility of arbitrary action by one department which might have materially affected the efforts of another in building good public relations.

Acting on the assumption that it is the function of the Sales Department of our organization to render a service to the customer, we have organized our forces, planned our activities, and trained our personnel along very different lines than if we were carrying on a straight merchandising activity. We feel strongly that the company should render such service to the customer as we can render better than any other agencies. The direct sale of appliances is not one of the things that cannot be done by others, and we are therefore confining our activities to the service features of selling which make a direct contribution to good public relations. We do not feel that aggressive merchandising is compatible with the best customer relations. The Sales Department of our company represents chiefly a consulting service to our customers and a consulting, planning and financing service to our gas and electric appliance dealers. In our Electric Department we sell no appliances directly except convenience items, such as lamps, cords, fuses, etc. In our Gas Department we sell no gas appliances except storage water heaters, and these are sold only to dealers. It is our expectation that, when dealers have been sufficiently educated to handle the direct sale of storage water heaters entirely, we will withdraw entirely from this position. We keep in the field continually, a group of "Greater Service Representatives," who call upon each customer periodically, in accordance with routings made up from our customer Kardex file, which contains all of the information as to each individual customer, including the appliances installed in his home. A Greater Service Representative has no appliances to sell, and it has been our experience that he is welcomed by the customer because of this fact alone. It is his duty to see that the customer is using our service to his best advantage, to adjust complaints, inspect appliances, and to point out to the customer ways in which our service could be of additional benefit to him. If the Greater Service Representative succeeds in the performance of his duties, the customers make fuller use of our service and our relations with our customers are improved. Prior to each call, the clerk who has charge of our customer file writes to each customer, stating that the call will be made and giving the reason for it.

This letter serves two purposes: first, to introduce the company representative, stating the reason for the call; and second, to definitely designate the calls to be made by the representative, so that complete customer coverage may be secured. The call results in the filling out of a survey card, which is used to keep the information in the customer file up to date and to note the prospects as to the sale of additional appliances. These representatives form the service group in our sales organization.

In addition, we have in each of our major districts a Sales Supervisor, who is responsible for all retail sales activities in his territory. This includes the analysis of his market from his customer records, the organizing of his dealers and jobbers for effective selling, the holding of sales schools for dealers' salesmen, the handling of all prospects for appliance sales turned in to him by the greater service representatives, and the promotion of the company's full-use gas and electric home plans, which I will refer to later.

As previously stated, in the gas department the company sells no appliances except storage water heaters, which are sold only to dealers. The company has, however, a group of salesmen in the field who are under the direct control of the sales supervisor. These salesmen sell storage water heaters almost exclusively. The sales, however, are made through the dealers and each dealer compensates the company for the salesman's commission on each sale made through him individually. We have maintained this direct control of the sale of storage water heaters, because we feel that it is still in the pioneering stage, but we are looking forward to the time when dealers will build up their own sales organizations so that we can withdraw our salesmen from the field entirely, or at least transform them into greater service representatives. In other words, we are planning to parallel in the domestic field the same kind of engineering service for the household which we have maintained in the industrial and commercial field for years and which the industry practices generally. That is, we have power engineers, lighting specialists, industrial and commercial gas engineers, etc. We feel that the same type of consulting service can be given to the domestic customer and that such service, divorced from the direct sale of the merchandise, will result in excellent public relations.

In addition, we have established under our sales supervisors a Home Modernizing Bureau. The representatives of this bureau furnish a consulting service to our residential customers, as the result of requests made by customers called upon by our greater service representatives, reading our advertising or discussing modernizing problems with our dealers. The Home Modernizing Bureau representative calls upon the customer, makes a survey of the home, discusses with the customer the particular problem involved, makes a

report directed to the customer personally, bound in a neat cover on which a picture of the customer's home is shown. The report includes a statement of the modernizing proposed, cuts of appliances suggested for installation (if any), an architect's sketch in color of any proposed new kitchen layout, and finally, full estimates of the total cost of the job, including installation of appliances, carpentry, painting and other decorating work involved. The problems presented to the Home Modernizing Bureau are varied and include kitchen and pantry layout, installation of new appliances, kitchen decorations, lighting recommendations, choice of color schemes for curtains, wall paper, lamp shades, etc., and many other questions, all of which present a real problem to the customer—a problem which the customer delays decision on indefinitely, chiefly because of the irritation and annoyance involved in getting estimates and reaching all of the detailed decisions as to just what should be done. The Home Modernizing Bureau gives him a complete report which treats his own specific problem fully and provides to him all of the necessary information upon which to base a decision. Approximately 80 per cent of the suggestions made to the customers in these reports have been adopted. This represents a real service to the customer and to dealers generally, and it is an activity which we feel has great future possibilities in connection with the service which we render to our customers.

No discussion of public relations can be complete without reference to the work of the Home Service Department. The early work of the home service departments in the industry, in teaching the use of modern ranges and in combating the trend away from home cooking, has now been broadened to include an individual service in the home through the medium of home calls on new customers. In my own company we feel that the new work of our Home Service Girls is a great factor in the maintenance of good public relations. Our Home Service Girls call upon each new range user or storage water heater user and are an important factor in keeping these appliances sold, inasmuch as they demonstrate to the customer the service which the appliances will render. In addition, they spread the idea of the full-use gas or electric home and have been of great assistance in showing the customer the value of our service as against the service of other fuels.

We have been developing during the past year full-use home plans in both our gas and electric departments. In the electric department the plan is beyond the experimental stage and we have twelve homes which have operated under it for over a year. Under this plan we install complete electrical equipment throughout and allow the customer to pay for the merchandise, plus the current consumed, up to 7,000 kilowatt hours per

year, at the rate of \$30 per month, in the average case, over a five-year period. Any consumption over 7,000 kilowatt hours per year is adjusted for at the end of the five-year term, when the appliances become the property of the customer and appliance payments cease, by continuing the \$30 per month payment for a sufficient number of months to wipe out the accumulated deficit. Under this plan a customer may put in complete electrical equipment of reasonable size, with the assurance that his bill for current and for time payments on appliances will not be more than \$30 per month. If the customer already has some of the electrical appliances which constitute a full-use home, we allow him to buy the additional appliances and to pay \$30 a month for some term less than five years, depending upon the cost of the additional appliances. If very much larger appliances are required than under the normal plan, arrangements can be made for payment of \$35, \$40, or \$45 per month, etc.

We have just developed a similar plan for a full-use gas and electric home which contemplates the installation of a gas range, gas storage water heater, gas house heater, and optionally, an incinerator substituting these appliances for the electric range and water heater in the full-use electric home plan. Under the combination gas and electric plan the full-use customer can install the normal sized appliances and pay the time payments due each month with the cost of the gas and electricity consumed in equal monthly payments extending over a five-year period, at the end of which time the appliances become his property and he is then billed on the regular gas and electric rates applicable.

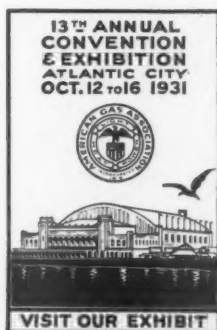
In cases where the customer cannot afford gas house heating, the payments for the appliances and the gas and electricity which they consume are as low as \$20 per month for the five-year period. In cases where the gas house heater is included, the payments range from \$45 to \$70 per month for the five-year period, depending upon the number and size of the appliances installed.

In conclusion, I think you will agree with me that the most important factor in good public relations is employee training. Lack of knowledge on the part of employees as to the company's business generally and as to the particular subject with which they are dealing, has a very detrimental effect upon the relationship with the customer. During the past year we have carried on an educational program with all of our public contact employees in our Commercial Department, designed to educate them in all of the personal characteristics which assist in making helpful contacts, and we are now engaged in an educational activity on "Information Giving," or, knowledge of the company's business. The entire activity has been carried on by the

employees themselves, by the conference method, the whole personnel having been broken up into discussion groups, each group presided over by a conference leader, who has been furnished with a conference guide and who has in each case developed the thoughts of his group on each particular subject and reported them in writing to the director of the activity. The composite result of all of these conferences is expressed in a booklet entitled "Our Customers and You," copies of which have been distributed to you for your review, if you are interested. The booklet was not written in our general office and handed to the employee for his study. It was developed by the employees themselves as a result of their own thinking, and represents the composite views of the group on each particular subject, so that we feel it is of inestimable value to them, inasmuch as they have all had a part in its creation. The hand-book which we are preparing on "Information Giving" is being developed in the same way. You will appreciate that by this method the employees are creating something for themselves rather than reading something handed down to them from the top. We feel that this activity is of vital importance in the creation of good public relations, and we recommend to all public utilities the initiation of similar activities, either through courses offered by the national associations or through courses developed within their own organizations.

A. G. A. Exhibition Labels

EXHIBITORS at the 1931 convention of the American Gas Association have recently been furnished with a supply of exhibition stickers illustrated below. Any additional supply for use by exhibitors, their branch offices, or agents may be had on application of the Director of Exhibits.



Manufacturer company members not exhibiting may secure a supply of convention stickers on application of the secretary of the Manufacturers' Section.

Just Released

What's Within the Gas Range

An illustrated booklet on the modern gas range—full of unbiased, general information which should bring about a better understanding of gas as a cooking fuel, and an appreciation of the modernity of the range.

Copies of the booklet may be secured in any quantity at the following costs:

10¢ each	up to 100
9 1/2¢ each	100 to 500
9¢ each	500 to 1000
8 1/2¢ each	1000 to 2500
8¢ each	2500 and over.

Company name may be imprinted on the back cover for slight additional cost.

For
Further Information
Write to

American Gas Association
420 Lexington Avenue
New York, N. Y.

Technical Section

R. G. GRISWOLD, Chairman

H. W. HARTMAN, Secretary

K. H. CREE, Asst. Secretary

I. K. PECK, Vice-Chairman

Joint Production and Chemical Conference

THE fifth annual Joint Production and Chemical Conference was held at the Benjamin Franklin Hotel, Philadelphia, Pa., last month with an unusually large attendance of delegates from various sections of the country.

This conference has enjoyed great popularity for the past five years and held true to its usual reputation in bringing to light many new and interesting problems, not only in the gas production field itself, but also in the allied industries.

The first day's program was devoted to sessions of the Chemical Committee and the Carbonization Committee of the American Gas Association. During the chemical session some extremely interesting papers were read. Many new ideas were brought forth on the effect of furnace atmospheres on heat treatment of non-ferrous metals, which is of major importance to the industrial gas world and the chemist who is concerned directly with the solution of many of these problems. The value of the photo-electric cell and its application to gas plant operation was expressed in an interesting paper and a great deal of enthusiasm was created in this new development.

The chemists also enjoyed an evening session, which brought forth many new and interesting developments in the protecting of metal surfaces, laboratory equipment and an interesting paper on solvent analysis as applied to coal which was a contribution of the Bureau of Mines.

Valuable papers were presented by the Carbonization Committee, particularly with relation to coke marketing and coke treatment. Ammonia merited a place on the program this year and an informative report was read. "New Developments" and "Coke Statistics" proved worthy contributions.

Under the auspices of the Water Gas Committee, the subject of "Mixing Gases" seemed to attract wide interest. The importance of new developments along this line was brought out by several presentations, which covered situations in many localities throughout the country. Natural gas, which has come into its own during the past two or three years, does not promise to give way to a complete displacement of the manufactured fuels now in wide use. The mixing of natural gas with water gas and other local fuels seems to be the more logical solution to the problem of utilization of the large available supply of this gas. Coke oven gas, refinery gas, producer gas and many others will have their place along with

natural gas in supplying the demand for the greatly increased quantities of gaseous fuel now being used. There are many localities where the practice of mixing gases is being successfully carried out with excellent results. Many new types of mixing devices have been developed and fluctuations in heating value, gravity and volume are rare.

Bunker C oil utilization both in the Middle West and on the Atlantic Seaboard produced considerable discussion. Many companies are reporting the successful use of this heavy oil as a carburant which incidentally provides a new market for this so-called dump fuel.

Safety in water gas production stimulated considerable interest in this subject, which is of vital importance, not only to the water gas man, but to all who are chiefly concerned with plant operation.

New developments in water gas manufacture were reported upon by the chairman of this committee. New processes for manufacturing are numerous and a

wealth of information on the subject was made available.

The evening session, which was initiated this year, came forth with a fine attendance not only of the chemists but from all delegates to the conference. The usual afternoon session on this day was forfeited for an interesting inspection trip which was arranged by the local gas companies and about 180 members went along. Buses were provided and delegates were taken to plants and departments in and about the city. The trip also included a visit to the reforming plant at Chester, Pa.

As in former years the chemists held their dinner meeting during the evening of the first day. Reports of the various subcommittees were read by the chairmen after which a demonstration was conducted on possible uses for the photo-electric cell in the gas industry. The Water Gas and Carbonization Committees also held their usual Spring meetings during the conference.

Three Questions Are Answered

THE three questions and answers below are reprinted in the A. G. A. MONTHLY because of their general interest to accountants at this time.

The Committee on Uniform Classification of Accounts is prepared at all times to interpret problems arising in the application of the Classification. Address inquiries to the Chairman, H. M. Brundage, Association Headquarters, 420 Lexington Avenue, New York, N. Y.

Question 1—Assume that we have a water gas manufacturing plant which, in addition to the usual low-pressure and relief holders located on the plant site, has a system of high-pressure pumps which pump gas from the low-pressure holders to a high-pressure holder, also located on the plant site. The gas is then transmitted and distributed to all parts of the community under high pressure. Is the expense of pumping the gas from the low-pressure storage holder to the high-pressure holder a Production Expense or may it be considered Transmission Pumping?

Answer 1—Every member but one states, unequivocally, that this expense is properly chargeable to "Transmission Pumping." The one dissenting member is inclined towards "Production Expense" but concedes that the former classification can be sustained.

Question 2—A second problem arises where the high-pressure holder, as set out above, is located not on the plant site, but at some considerable distance from the plant. In this case, should the pumping expense from the plant to the holder be classified as Production or Transmission?

Answer 2—Every member states, unequivocally, that this expense is properly chargeable to "Transmission Pumping."

Question 3—A third problem is presented in the generating of gas, for instance, in a coke oven plant at one location, and pumping such gas at low pressure over a considerable distance from the plant to the low-pressure holders. In this case, would the cost of such pumping be classified as a Production or Transmission Expense, particularly in as much as this cost, if incurred ordinarily within the physical limits of the plant, would be considered as production?

Answer 3—There is substantial unanimity among the members that this expense is properly chargeable to "Production Expense." Several members qualify their position by saying, substantially, that in case the low-pressure holder is so far distant from the generating plant as to require the operation of boosters, this additional cost is chargeable to "Transmission Pumping."

Publicity and Advertising Section

DONALD M. MACKIE, Chairman

ALLYN B. TUNIS, Secretary

WILLIAM H. HODGE, Vice-Chairman

Advertising and Selling—The Salesmanager's Team*

EVERY sales manager drives a team. One member of that team is the sales force—a salesman. He's a live person who reports every day. You can't forget him, and you are very conscious of him because he brings in (or sometimes doesn't) the orders which are the measure of success of any sales manager.

The other member of the team is invisible. You never see him, but you never make a sale without him. He is present at every meeting between a salesman and a prospect. He was with the prospect when the salesman arrived and he will stay after the salesman leaves. The invisible salesman is the prospect's opinion.

Usually you can't tell where opinion came from. Sometimes it comes from personal experience—sometimes from something somebody or a lot of somebodies have said—sometimes from advertising.

It has been only during the last thirty years or so that business has found out about influencing opinion on a big scale. In the old days about all a merchant could do was to live right and hope his customers wouldn't hear about his blunders.

But now the technique of using advertising to influence opinion is far advanced. Some business men think advertising is so far advanced that they no longer need to live right. They think if they advertise enough they can sell inferior merchandise and ignore the basic factors of character. But sooner or later such people come to grief.

Both advertising and selling are done to get sales, but they work in different ways to accomplish that end.

The salesman is interested in individuals. He changes his approach, his argument and his entire plan to meet the varying types of people to whom he is going to sell.

Advertising is concerned with thousands. It must select the methods and the appeals which will interest the largest proportion of the people who see it.

If it succeeds, your salesmen have an ally. Opinion whispers "yes" to many a prospect's mind as the salesman talks. And that's swell—you are probably going to get an order. If opinion whispers "no," the selling will be tough.

Nearly every prospect adopts an attitude of resistance when a salesman is talking to him—but it helps to have the invisible salesman around somewhere

By EGBERT WHITE,

Batten, Barton, Durstine & Osborn, Inc.

whispering, "That's right, you know that's true."

Now in the metropolitan New York territory Electrolux has a good many invisible friends. Your salesmen in most cases find that opinion is backing up what they are saying. The prospect, no matter what resistances he may be putting forward, is saying to himself, "Cousin Mary certainly has found her Electrolux satisfactory. That idea of no machinery is certainly a good one," etc., etc.

For three years the gas companies in metropolitan New York has cooperated with the manufacturers of Electrolux in creating this mass of favorable opinion with advertising. This cooperative undertaking is unique in gas company advertising, and its success should point a moral which I will touch on later.

The appeals used in Electrolux advertising have followed a carefully planned sequence through the three years you have been active in selling gas refrigeration.

At first the advertising was built on the news interest of making ice from heat—of using a gas flame to make ice. At that time we had to tell people the astonishing fact that there was a gas refrigerator. And we had to tell them a good deal about how it was discovered, how it worked, how safe it was.

Then people came to realize that such a thing as a gas refrigerator actually existed, that it worked, that people were really buying it. So in 1930 Electrolux advertising sought out the chief advantages of Electrolux over electric refrigeration and persistently and dramatically told people that Electrolux is silent and less costly to operate.

That campaign brought us to 1931. Automatic refrigeration is accepted as essential to modern standards of living. From the scores of manufacturers who entered the refrigeration field a half dozen have emerged as leaders. All these manufacturers make a pretty satisfactory refrigerator. All claim pretty much the same things. All assume the superiority of electricity.

It's one lonely gas refrigerator against the field. Electrolux therefore accepts the distinction of battling single-handed against the industry, and its advertising promotes in every way the thought that Electrolux is unique—alone in its advanced, scientific and practical features of operation. The electric industry tries to set Electrolux aside in a place by itself.

The gas industry is putting it in a place out in front.

In 1931, therefore, Electrolux advertising talks of the marvels of gas refrigeration. "Incredible until you know the secret," says Julius, the magician. "Seems like magic, yet really so simple," says the Hindu wizard.

In the metropolitan newspaper campaign pictures of old-fashioned scenes and subjects focus attention on the fact that "the older order changeth yielding place to new." That's a line that is catching on. You hear it in conversation. The editor of the *New York Journal* recently used it as an eight-column streamer head over a page of pictures of the Spanish revolution.

Last week one of our electrical friends in New York asserted in advertisements that "the old order changeth, and gas gives way to electricity." If he had been as confident of that as the words indicate, I doubt that he would have been interested in spending several thousand dollars to share the opinion with the world at large.

The success of the refrigeration campaigns of the gas companies participating in the Electrolux metropolitan advertising has been of outstanding and significant interest, not only to the refrigeration industry, but also to the gas industry.

Every gas company participating in this campaign has, I believe, shown an increase in sales in 1931 over 1930. The total sales for the metropolitan area for the first quarter of 1931 are nearly triple the same period of 1930.

In many cases the sale of gas refrigeration has saved the cooking load which would otherwise have gone to electric ranges.

The success of the metropolitan companies in cooperating for three years in a unified advertising campaign on gas refrigeration points the way to greater success for the gas companies in all their sales effort.

I think you will all agree with me that over a half century our friendly competitor, the electric industry, has developed the idea in the public mind that any change to electricity—no matter from what—is an advance. Gas lighting gave way to electric lighting—an advance. In industry, electrically driven machines replaced machines driven from a central power plant—another advance. Electrically driven battleships and liners replaced a former type of motive power—another score for electricity. In the home the electric iron, the electric coffee pot,

* Address presented before the Metropolitan Gas Regional Sales Conference, Lake Mohonk, N. Y., May 21, 1931.

the electric vacuum cleaner, the electric clock, the electric this and the electric that have gotten the public used to accepting the idea that anything electrical is just naturally better than the thing that it offers to replace.

This success idea is fostered by the overwhelming preponderance of electric appliance advertising as against gas appliances. I have checked one issue of three current magazines—*The Saturday Evening Post*, *The Ladies Home Journal*, and *Good Housekeeping*—for advertisements featuring gas and electric appliances. There are seven for gas and forty-six for electricity.

On the air the "House of Magic" continually glorifies electricity. What comparable story is reaching the public on gas?

Can you blame people for a tendency to accept anything the electrical industry offer as the latest and most modern thing?

But in the case of refrigeration, the metropolitan group has met the electrical industry on its own ground and defeated it. An important factor in this accomplishment has been the cooperative use of advertising. For more than three years gas refrigeration has had a coordinated, unified advertising presentation. It has been powerful, persistent and dramatic. Without cooperation—even with the same expenditure—it would have been scattered, irregular, not unified, not concentrated for definite periods on definite ideas.

Competition in the refrigeration industry has been tough, but I see no signs of its getting any easier. It will probably get tougher. Only by continuing to stand together in cooperative advertising can the gas companies use their force effectively in this competition.

Isn't there a broad lesson in your cooperative success with Electrolux? Is refrigeration the only product upon which gas companies within a single trading area can cooperate with manufacturers? Why not on house heating, water heating, modern cooking equipment? The gas industry hasn't as many appliances to advertise as the electrical industry. Therefore it is essential to the industry that coordinated, cooperative effort be applied against the appliances that offer you load-building markets.

Forget the things that keep you apart. Concentrate on the things that bring you together. The things that keep you apart are trivial. The things that should unite you are of the utmost consequence.

The selling side of the salesmanager's team is a strong, willing, well-trained horse. But without cooperation the advertising side of the team is a weak and limping partner.

Don't be content with a horse you can ride. Get a team you can ride.

Apartment Shop Is Ideal For Appliance Displays



Above—This beautiful apartment, featured in the "Apartment Shop," has a layout that is a real tribute to the silence of the Gas Refrigerator. Arrow points to the location of the refrigerator. Below—Attractive and efficient kitchens on display at the "Apartment Shop" feature the automatic gas refrigerator and the gas range.

THE "Apartment Shop," recently opened by the Henry Mandel Companies, at 385 Fifth Avenue, New York City, represents one of the most interesting and unique methods yet devised for the rental of apartment suites.

At the same time, it offers the Consolidated Gas Company of New York an exceptional opportunity to display the automatic gas refrigerator and the modern gas range in apartment settings identical with those found in the various Mandel developments in Manhattan. The kitchens of the apartment houses and apartment hotels owned and operated by the Mandel Companies are equipped with Electrolux gas refrigerators and gas ranges, the London Terrace, Chelsea Corners, and Parc Vendome developments being among the largest and best known.

The "Apartment Shop," which occupies the ground floor and basement of the building at Fifth Avenue and 36th Street, has proved to be a popular innovation with New Yorkers. Here, in the heart of the shopping district, one can shop for an apartment "over the counter," closely inspecting the five different suites which are actual reproductions of Mandel apartments, even to door knobs and color schemes.

The success of the venture is already assured. More than 7,000 persons visited the "Shop" on its opening day, and since then the average daily attendance has exceeded 2,000. The advertising and sales efforts of the Mandel Companies, formerly directed toward luring the prospective tenant to one particular building, will



now be concentrated upon its model apartments. "Pick out the apartment you like," reads a newspaper advertisement, "and we'll set it down in the location most convenient for you."

The "Apartment Shop" is, in effect, an ideally located display room for modern gas appliances, according to N. T. Sellman, assistant secretary and director of sales and utilization of the Consolidated Gas Company.

"The Shop offers us the opportunity of displaying two major gas appliances in realistic apartment settings," he said. "The people who come to inspect these beautiful apartments will realize that the gas refrigerator and the gas range are important units in the modern kitchen."

The layouts of the apartments on display at the Shop are a direct tribute to the silent operation of the Electrolux gas refrigerator. In virtually all of the suites shown, the refrigerator is situated very close to the living room, but, because of its absolutely silent operation, this does not detract from the desirability of the apartment.

Gas Appliance and Equipment Developments

Pipe Cutter Available

Announcement has been made that the French patent pipe cutter, made by The A. P. Smith Manufacturing Company, East Orange, N. J., is available for cutting gas pipe up to 48" in diameter. Each size of this cutting device is designed so that it can be used on about three sizes of pipe—the No. 1 machine, for instance, being used for 4", 6" and 8" pipe, the No. 2 on 10", 12" and 16" pipe, etc. This cutter will cut pipe as evenly as if the work were being done in a lathe. The tedious work of cutting pipe with hammer and chisel or even acetylene torches and also the constant danger of cracking the pipe are both done away with.

To Use Hopane Gas

Plans for supplying bottled gas service in the territory beyond the company's present gas mains have recently been announced by the Central Hudson Gas & Electric Corporation, Poughkeepsie, N. Y. In developing this rural business the company will handle Hopane gas, supplied by the Hope Construction and Refining Company, a subsidiary of Standard Oil Co. of New Jersey, and Quality Gas Ranges, manufactured by the Roberts & Mander Stove Company, Philadelphia, Pa.

To Install Butane Plant

The New York Power & Light Corporation, Albany, N. Y., has contracted with the Propane-Butane Contracting Corporation, Baltimore, Md., for consulting engineering service covering a butane air-gas dilution plant to be installed at Canajoharie, N. Y. The plant will use the Kemp air-gas carburetion equipment.

New Shut-Off Valves

The North American Manufacturing Co., Cleveland, O., has the production of the Duplex Automatic Safety Shut-off Valves. These valves are described as unusual because they shut off the fuel if either the gas or air fail in low-pressure gas installations using blower air for combustion.

Everhot Describes Line

The Everhot Heater Sales Co., Detroit, Mich., has announced a new folder, giving general information and specifications on the entire line of Everhot and Par-X Automatic Water Heaters, copies of which may be had upon request.

American Heater Sold

Organization of the American Water Heater Company and the purchase by that

Contributions of new items by manufacturers of gas appliances and equipment to this department will be welcomed by The A. G. A. Monthly. On account of space limitations, all announcements of new products, improvements, etc., should be limited to about 100 words. No attempt will be made to describe each product or give details of construction. For such details address the manufacturer direct. Where justified, photographs will be used to illustrate these brief items. All contributions to this department should be addressed to C. W. Berghorn, Secretary, Manufacturer's Section, American Gas Association, 420 Lexington Ave., New York, N. Y.

company of the business and assets of the American Heater Corporation, of St. Louis, recently was announced. The American Water Heater Company has opened general sales offices at 20 North Wacker Drive, Chicago, and started on an active program of expansion in eastern and northern markets under the direction of J. G. Brown, general sales manager. R. D. Bitzer, 3142 North Broad St., Philadelphia, has been appointed Philadelphia division manager and John Fullerton, 11 West 42d St., New York City, has been appointed New York division manager.

New Model Water Heater

The Gas and Electric Heater Co., La Porte, Ind., has announced production of the 1931 Fauchot water heater. The mechanical construction of the new model is the same as that of the 1930 model. The exterior appearance only has been changed in order to embody eye appeal.

Booklet on Butane Gas Plant Control

How the operation of butane gas plants is made entirely automatic is described in a new booklet, titled "Butane Gas Plant Control," which has just been published by Cutler-Hammer, Inc., Milwaukee, Wisconsin, manufacturers of gas measuring and control instruments.

Describes Dryers

The Juddleson Dryer Corp., Mounts-ville, W. Va., is distributing a circular illustrating and describing four types of clothes dryers for domestic use. A supply is available for gas companies and dealers.

Foxboro Combination

The Foxboro Company, Foxboro, Mass., has added a combined recording, integrating and indicating flow meter to its line of flow measurement instruments. This instrument was designed for use on processes in which it is desirable to have a flow meter which can be read easily and instantly.

New Line of Ranges

The Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill., has announced new lines of console and table-top ranges. In addition to vitreous enamel finishes, these are being made in marble finish.

Are You Wearing the A. G. A. Pin?

These small emblems, designed in blue and gold, are unusually attractive and durable. Price \$2.

MAIL THE COUPON

AMERICAN GAS ASSOCIATION,
420 Lexington Avenue,
New York, N. Y.

Here's my check for \$2. Please send me an A. G. A. Membership Pin.

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Monthly Summary of Gas Company Statistics

FOR MONTH OF APRIL, 1931

Issued June, 1931, by the Statistical Department of the American Gas Association
420 Lexington Avenue, New York, N. Y.

PAUL RYAN, Statistician

REVENUES of manufactured and natural gas utilities aggregated \$60,076,833 in April 1931, as compared with \$61,957,931 in April 1930, a decline of 3 per cent, according to reports to the Statistical Department of the American Gas Association from companies serving 13,631,586 customers and representing about 90 per cent of the public utility distribution of manufactured and natural gas.

Revenues of the manufactured gas companies aggregated \$32,938,731 for the month, a drop of 2 per cent from a year ago. The natural gas utilities reported revenues of \$27,138,102, which were about

4.4 per cent under the figures for April 1930.

Sales of manufactured gas reported for April totalled 31,317,662,000 cu.ft., a decline of 2 per cent, while natural gas utility sales for the month were 64,975,615,000 cu.ft., a decline of nearly 8 per cent.

A significant feature of the data on natural gas was an increase of nearly 1 per cent registered in sales for domestic uses, reflecting in large part the industry's program of development and expansion into new territories not formerly served with gas. This expansion of the domestic business was most notable in the mid-continent

area, Kansas and Oklahoma both showing gains of nearly 30 per cent over April a year ago, while in Louisiana and Texas the gain in domestic sales averaged around 25 per cent.

Throughout the country generally, industrial gas sales, both for manufactured and natural gas utilities, continued at levels considerably below the preceding year. In New England, industrial gas sales were down 3 per cent, while in the East North Central states the decline in this class of business was nearly 8 per cent. For the country at large, natural gas utilities reported a loss of 13 per cent for the month in sales of gas for industrial purposes.

COMPARATIVE STATISTICS OF 161 MANUFACTURED GAS COMPANIES FOR THE MONTH OF APRIL, 1931

	Month of April			Four Months Ending April 30		
	1931	1930	Per cent Increase	1931	1930	Per cent Increase
Customers	8,992,700	8,972,999	0.2	<i>See April</i>		
Gas Sales (MCF)	31,317,662	31,999,648	— 2.1	128,390,984	130,186,819	— 1.4
Revenue (Dollars)	32,938,731	33,584,650	— 1.9	134,226,479	136,586,871	— 1.7
Gas Produced and Purchased (MCF)						
<i>Gas Produced</i>						
(a) Water Gas	15,595,256	16,490,215	— 5.4	66,198,430	69,491,309	— 4.7
(b) Retort Coal Gas	2,484,385	2,673,754	— 7.1	10,958,552	11,014,190	— 0.5
(c) Oil Gas	648,691	632,665	2.5	2,987,699	3,209,304	— 6.9
(d) Coke Oven Gas	4,471,286	4,055,512	10.2	17,156,536	16,014,346	7.1
(e) Reformed Oil Still Gas	376,989	142,185	—	1,457,954	598,800	—
(f) Total Gas Produced	23,576,607	23,994,331	— 1.7	98,759,171	100,327,949	— 1.6
<i>Gas Purchased</i>						
(a) Coke Oven Gas	9,038,987	9,445,611	— 4.3	38,164,482	38,827,863	— 1.7
(b) Oil Still and Natural Gas	429,815	311,453	38.0	1,400,104	1,237,131	13.2
(c) Total Gas Purchased	9,468,802	9,757,064	— 3.0	39,564,586	40,064,994	— 1.3
Total Gas Produced and Purchased	33,045,409	33,751,395	— 2.1	138,323,757	140,392,943	— 1.5

COMPARATIVE STATISTICS OF 161 NATURAL GAS COMPANIES FOR THE MONTH OF APRIL, 1931

Customers						
Domestic (Including House Heating)	4,397,814	4,338,112	1.4	<i>See April</i>		
Commercial	218,091	200,699	8.7			
Industrial	15,669	15,881	— 1.3			
Main Line Industrial	4,706	4,299	9.5			
Miscellaneous	2,606	2,960	—			
Total	4,638,886	4,561,951	1.7			
Gas Sales (MCF)						
Domestic (Including House Heating)	28,923,977	28,710,952	0.7	135,192,095	140,199,291	— 3.6
Commercial	4,178,885	3,645,260	14.6	20,135,378	18,853,920	6.8
Industrial	17,237,575	19,856,847	—13.2	69,220,944	81,011,559	—14.6
Main Line Industrial	14,007,821	17,415,956	—19.6	49,842,917	66,464,642	—25.0
Miscellaneous	627,357	760,881	—	2,355,200	3,037,768	—
Total	64,975,615	70,389,896	— 7.7	276,746,534	309,567,180	—10.6
Revenue (Dollars)						
Domestic (Including House Heating)	19,104,765	19,133,987	— 0.2	88,531,654	91,324,783	— 3.1
Commercial	2,047,336	1,932,017	6.0	9,699,403	9,434,388	2.8
Industrial	4,080,720	4,944,640	—17.5	16,549,542	20,321,295	—18.6
Main Line Industrial	1,810,426	2,191,038	—17.4	65,557,041	8,410,203	—22.0
Miscellaneous	94,855	171,599	—	419,457	701,978	—
Total	27,138,102	28,373,281	— 4.4	121,757,097	130,192,647	— 6.5

Associations Affiliated with A. G. A.

Canadian Gas Association

Pres.—Hugh McNair, Winnipeg Electric Co., Winnipeg, Man.
Sec.-Tr.—G. W. Allen, 21 Astley Avenue, Toronto.

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Thirteenth Annual Convention of the American Gas Association
Atlantic City, N. J. - - - October 12-16, 1931

Personnel Service

SERVICES OFFERED

Salesman—experienced in sales promotion of all gas appliances including gas house heating and distribution department of gas business; desires position with good opportunity for advancement. Capable of taking charge of sales or distribution department, small company preferred. Will go anywhere. Married. Age 35. 409.

Position of responsibility desired by experienced public utility executive. Possessed of diplomacy and ability in meeting the public. Good education, appearance, personality and business judgment. 410.

Gas engineer, now employed, desires change. Twelve years with large gas apparatus construction company. Experienced in designing, estimating and operating all sizes and types of gas plant equipment. 411.

Superintendent or Assistant (36) with sixteen years' experience in operation, maintenance and manufacture of water and coal gas plants. Understand high- and low-pressure distribution. Not afraid of hard work, can obtain results. Applicant willing to go anywhere his training and experience can be of use. 412.

Young practical engineer, eight years' experience in installation, maintenance and laboratory testing of all types of gas appliances; would like connection with manufacturing or gas company in New England or upper New York State. 413.

Salesman having had several years' experience in selling general line of gas equipment. 414.

Superintendent of small, or general foreman of large plant; twenty years' broad experience with various companies in manufacturing and construction. 415.

Gas engineer desires position as assistant to an executive of a public utility or of a manufacturing company. College education; six years' utility experience; prefers Eastern location. Knows industrial and house heating sales, development of new markets, rate and franchise matters, and public relations. 418.

Sales engineer, eighteen years' experience in utility sales department activities and management. Graduate engineer. Desires permanent position with utility or manufacturer. 419.

Superintendent of measurement and distribution of natural gas desires new connection. Twelve years' experience in all branches of the gas industry, including production, transportation, measurement and distribution, both industrial and domestic. Graduate Mechanical Engineer. Employed at present. Age 39. Married. 421.

Manager of group small properties with nineteen years' technical and practical experience in gas manufacture, high- and low-pressure distribution, construction, rate study, sales and public relations. Has built up several run-down properties. Desires similar position or assistant to executive with opportunity for advancement. 422.

Manager with twelve years' experience in all phases of natural gas business desires position as manager of small plant or assistant to manager of large plant. 423.

Commercial manager with a record in the electric as well as the gas industry wishes a new connection in which to demonstrate his sales ability. Broad experience and a record of accomplishment in the appliance manufacturing as well as the utility field. Versed in sales research, budget control, surveys, reports, etc. Also publicity and gas engineering. Now located in the east. 425.

Manager, University Graduate (M.E.) with five years' experience in production, distribution and industrial engineering; qualified to manage property 5000 to 10,000 meters. 428.

SERVICES OFFERED

Chemist, experienced in the preparation of reports, cost estimates, market surveys and in patent and literature searches. University graduate, M.S. (33); ten years' research experience in gas and oil fields. 429.

Engineer-Manager with technical education and eighteen years of service in all branches of the gas industry, both manufactured and natural, including public utilities commissions, desires position with considerable responsibility requiring executive ability, technical training and practical experience. 430.

Salesman with twelve years' experience, mostly gas ranges, as manufacturer's representative selling the public utilities in Metropolitan New York and Mid-West, desires a new connection with a progressive manufacturer or public utility. 431.

Gas boiler salesman and engineer with manufacturer or gas company. Twelve years' experience, sales-engineering all phases of gas boiler application and control work. Can figure radiation B.t.u. transmission method, lay out and supervise all types of heating and installation; good gas company and trade following. No objection to travelling. 432.

Industrial engineer (38) with technical and cadet education; twelve years' experience in application of natural and manufactured gas for industrial, commercial, power, large heating boilers and house heating purposes. Experience includes industrial surveys, sales, equipment design, installation and adjustment; interested in new connection with gas company or appliance manufacturer. 433.

Twenty years as **Manager**. Have thorough practical working knowledge of every department, and excellent record for economical operation. Coal or water gas, high or low pressure. I can put your plant on a sound basis and get results. Married. 434.

Public relations adviser available for public relations or supervisory or managerial position with public utility; or secretary public utility association. Wide experience in this field as Association Secretary. Now located in Southwest, but willing to go elsewhere. 435.

Man 36 years of age with well rounded utility experience having been general manager of a small property, **house heating engineer** for a metropolitan company, sales manager for a gas and electric company, of 125,000 meters, coal and water gas plant experience, gas and electric appliance buying and merchandising, available now. 436.

Engineer-accountant, experienced in public utility, general accounting, municipal, state and federal tax procedure. Background includes federal service and state regulatory work in capitalization appraisal and valuation. Thoroughly familiar with modern rate structures and preparation of rate case material and exhibits. 437.

Engineer-executive (36) of proven ability handling unusual difficulties in operation and construction. Twelve years' experience manufactured gas and four years' electrical. Mechanical engineer graduate. Familiar New England and Canadian territory. Will go anywhere where there is real work to be done. 438.

Accountant-Auditor, broad experience in utility and public accounting. Speaks Spanish, Portuguese, some French and German. Accustomed to living and traveling abroad; willing to travel or locate anywhere. Has executive ability and initiative; used to handling confidential matters and dealing with public officials. 439.

My record of results as an owner of three plants (coal and c.w.g.) makes me available to those desiring a first class **manager**. Have lately disposed of last property and am open for an opportunity in any location. 440.

POSITIONS OPEN

Leading manufacturer wants **gas range construction engineer** with expert manufacturing knowledge on pressed steel and grey iron construction. Must have successful record and experience with ability to take complete charge. Wonderful opportunity for the man who qualifies. State salary earned in the past and give complete detailed information as to experience. 0207.

Manufacturer's Representatives to handle well-known line of Circulating Cabinet Heater. Have interesting proposition for representatives who have had experience in handling this type of equipment. 0211.

Stove Merchandising Men: If you are a live, aggressive, high-grade man familiar with public utility requirements and seek an opportunity of associating yourself with a leading manufacturer offering the best stove values in the industry, state your qualifications and communicate with 0214.

Engineer to lay out and conduct research work on industrial gas applications. Location Ohio. Must be technical graduate with several years' experience in industrial department of gas company. Age preferably 30 to 35. Good opportunity for advancement. State age, experience in detail, and salary expected. 0216.

Manufacturer's representatives wanted to contact utilities with high grade line of automatic storage gas water heaters and conversion burners now being marketed by one of the country's foremost heater manufacturers. Company now making sales arrangements for entire country. Some very desirable territories still available. Straight commission arrangement. 0217.

Rate engineer with both engineering and accounting experience. Knowledge of rate forms, structure and rate-making necessary. Salary about \$4000. 0218.

Manufacturer of gas ranges and appliances with national distribution, one of the leaders in its field, has place for several keen, aggressive utility salesmen with proven sales ability and successful sales records willing to invest some time working in a junior capacity with possibilities for advancement. Interview determined upon complete information regarding ability and record. Positions available are in the East. 0219.

Advertisers of "Positions Open" receive many communications and when preparing a "short list," or making a final selection, the letter of application constitutes the only spokesman for the individual out of a large number of qualified personnel.

Attention is invited to a few of the apparently minor, but actually very important, considerations often overlooked in applying for advertised vacancies. First are neatness, conciseness and accuracy, and use of the typewriter is essential; next is furnishing full details of all the information requested by the advertisement and another is that only advertisements in the current issue of the MONTHLY should be acknowledged.

The market for selling personal service is strongly competitive and all of the legitimate sales methods may be necessary.

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